

THIS WEEK IN METALWORKING

NEWS

Behind the Scenes	6
Letters to the Editors	12
Metalworking Outlook	79
As the Editor Views the News	83
The Metalworking Contract Summary	92
Checklist on Controls	93
Windows of Washington	94
Mirrors of Motordom	101
The Business Trend	105
Men of Industry	109
Obituaries	112

PRODUCTION-ENGINEERING

Production and Engineering News at a Glance	115
One World in Metallurgy?	116
Who Has the World's Metals	120
1951 Metal Congress and Exposition:	
Program—American Society for Metals	125
Program—American Welding Society	128
Program—Institute of Metals Division, AIME	130
Program—Society for Non-Destructive Testing	132
List of Exhibitors	135
Progress in Steelmaking—Calcium Cyanamid . . . Source	
of Nitrogen in Steel	138
Calendar of Meetings	236
New Products and Equipment	241

MARKETS

The Market Outlook	261
Metal Prices and Composites	262
Nonferrous Metals	273
Metalworking Briefs	281

Editorial and Business Staff—Page 10. Advertising Index—Page 289. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Next Week . . . Boron Engineering Steels . . . Big Space Savings Realized in Brazed Aluminum Heat Exchangers . . . Practical Heat Treatment Stress Relieves Stampings . . . Faster Mill Speeds Increase Rolling Capacity

Now!

A SURE WAY TO PRODUCE
MIRROR FINISHES, FASTER



ELGIN DYMO

Diamond Compound

- ✓ PLASTIC MOLDS
- ✓ CARBIDES
- ✓ DRAWING DIES
- ✓ PRECISION PARTS
- ✓ CUTTING TOOLS

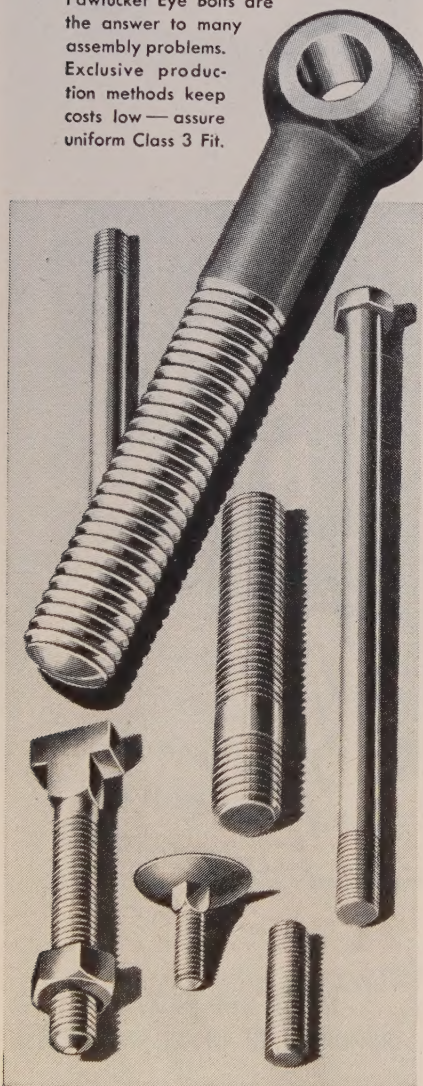
TESTED AND PROVED BY
HUNDREDS OF INDUSTRIAL USERS!

You can reduce finishing and polishing time in your shop—and get mirror finishes every time—with DYMO FINISHING. Elgin DYMO Diamond Compound . . . containing pure, Elgin graded diamond . . . comes ready to use, minimizes waste and cuts faster. Write today for free demonstration—proof of DYMO FINISHING advantages.

ABRASIVES DIVISION
ELGIN NATIONAL WATCH COMPANY
ELGIN, ILLINOIS

Looking for specialties EYE BOLTS

Accurately made in sizes $\frac{1}{4}$ " and larger, or to your specifications, Pawtucket Eye Bolts are the answer to many assembly problems. Exclusive production methods keep costs low — assure uniform Class 3 Fit.



BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners
for Economy and Reliability



Behind the Scenes...

Fanfare

Sound the trumpets! This is STEEL's One World issue, to mark the World Metallurgical Congress and the American Society for Metal's annual show, to be held jointly in Detroit Oct. 15-19.

The editors have been burning the midnight oil for weeks, travelling all over the country to put together some unique information. One article is on One World in Metallurgy beginning on p. 116. That gives an analysis of metallurgical problems faced in foreign countries and was gathered from interviews by the editors with foreign metallurgists.

Beginning on p. 120 appears another piece de resistance, an analysis of who has the world's metals, worked up by Managing Editor Walt Campbell. Listed to the east of here is a metal-by-metal scoreboard showing which area of the globe has the most, the Communist or free world.

The cover on this issue is something special, too, because it contains a photograph of one of the most modern tools to help the metallurgist. It's the picture of a Magna-Viewer being used for grain size determination on the Bausch & Lomb Balphot Metallograph.

Speaking of the first-rate photos we've been getting for our covers, did you note the honey we had of an electric motor on the Sept. 17 cover? It was a picture of a Westinghouse unit.

Capitalist

We were haunting the halls of the editorial precincts the other night in search of news for the column. And we found it—in the person of Geraldine, our night editor who doubles in brass as cleaning woman on the building staff. She didn't notice our approach because she was so absorbed in the Dow-Jones stock-news ticker, which flashes business news to our editors from all parts of the world.

"Aha!" we shouted gaily. She almost jumped a foot. "Investing your idle funds in the stock market, eh?"

"Not stocks, numbers." She looked us haughtily in the eye. "I'm checking for a friend."

Mythology

Our classical education was sadly neglected in our youth, so we only found out last week that Vulcan is the god of metalworking. Now that we know it, we're wondering what to do with it. Since we're the Maga-

zine of Metalworking, we ought to be able now to weave a neatly turned classical illusion, but we've used up a whole page of copy paper with experimental phrases. Alas, all the allusions turn out to be illusions, and not at all neat.

Generated in Washington

A little item appeared in last week's Windows of Washington section that deserves further comment. It concerned a Department of Interior scheme to install equipment on top of windy hills that would generate electricity for power-short areas. Is there any electricity scarcity near Capitol Hill in Washington?

Ringer

We have—or rather up until a few days ago we thought we had—a precise idea of who was in STEEL's reading audience. We got a surprise, though, when reprint orders began pouring in for the story on conventions and how to attend them that we ran in our Sept. 3 issue. Among those requesting reprints were the Milk Industry Foundation and the National Potato Chip Institute.

Puzzle Corner

We explained last week that the puzzle in the Sept. 24 issue was to find the puzzle. Because of a complicated chain of circumstances that we won't go into here, we inadvertently left it out. So, to make up for our oversight we're giving you two especially tricky ones this time.

A man six feet tall, stands six feet from a vertical plane mirror. What is the height of the smallest mirror in which he can see his entire image?

If the same man is twelve feet from the mirror, what would be the effect on the size of the mirror?

Here's the other:

Two pre-war wine merchants entered Paris, one of them with 64 casks of wine, the other with 20. Not having enough money to pay the customs duties, the first paid 5 casks of wine and 40 francs, and the second paid 2 casks of wine and received 40 francs in change. What was the price of each cask and the duty on it?

Shradu

award to American Machine & Foundry Co. to make automatic bar machines and Warner & Swasey Co.'s award to Harris-Seybold Co. to produce chucking machines.

On Copper and Aluminum

The outlook for copper supplies is as grim as ever; aluminum prospects are better. Although we can't get enough copper now, many copper people believe that the present output of domestic ores can't be maintained in 1952-53, because of dwindling resources. Ironically, we have excess copper refining capacity today. Rain in the Pacific Northwest means more electric power and consequently more aluminum from that area. Much of the aluminum capacity expansion should be coming in by the second quarter of 1952. Planned is a 90 per cent increase in aluminum production that will make the total capacity enough for both the military and civilians, barring an allout war.

Materials Use: Peak in 1952

The peak take of all materials by the military will occur in the second quarter of 1952. Consumption will level off from then on—unless a revised guided missile and aircraft program comes about, and then the whole picture would change overnight. The idea is to equip the military for one year of war. The basic material stockpile objective is five years, but we're far short of the goal.

New Deal in Industrial Architecture?

Watch for an evolution—perhaps even revolution—in design of industrial plants. The trend is just starting to build facilities that could easily be adapted for either war or peace production. Strong advocate of the dual-purpose facility is GM's C. E. Wilson. Coming may be new architectural standards, sponsored by government, for factories to be built in the future.

Straws in the Wind

Warehouse steel allocations in the first quarter of 1952 for farm equipment manufacturers will probably be 100 per cent of the base period . . . Government lost a good man and industry gained one when James Boyd, after a series of disagreements with Interior Secretary Oscar Chapman, left Washington for Kennecott Copper Corp. . . . Final CMP allocations for the first quarter should be ready by Oct. 15 . . . Structural steel users could use 220 per cent of the available material in the first quarter.

What Industry Is Doing

Business prospects are good for all except manufacturers with little or no defense work (p. 87) . . . A committee will study "birthmarking" alloy steels for better identification (p. 87) . . . High cost and scarcity of labor is helping to lift 1951 sales of industrial trucks to double the 1950 level (p. 88) . . . Bridgeport Brass Co. is going to start converting aluminum ingots into finished products (p. 89) . . . American users may get more industrial diamonds (p. 98) . . . A new allocating system for selenium is now in the works (p. 99) . . . Progress in getting government contracts is fairly good for defense production pools (p. 99).



October 8, 1951

Free World Fraternity

Next week thousands of persons identified with metalworking will converge on Detroit for the 33rd National Metal Congress and Exposition. They will inspect hundreds of exhibits at the spacious Michigan State Fair Grounds and participate in dozens of technical sessions sponsored by American Society for Metals, American Welding Society, Metals Branch of American Institute of Mining and Metallurgical Engineers and Society for Non-Destructive Testing.

There are indications that the Congress and Exposition will surpass all predecessors in interest and attendance. However, the feature that distinguishes next week's event from previous affairs is the first World Metallurgical Congress which will be held in conjunction with the regular Congress and Exposition. Several hundred metallurgists and metal production executives from 29 nations have been in the United States since mid-September. They have been inspecting American production and manufacturing techniques. Their visit to Detroit and their participation in the Congress will be the climax of their tour.

The associations formed by these visitors during their trip and in the Detroit assemblies have tremendous possibilities. Such exceptionally talented conferees from so many nations of the free world cannot be in almost daily contact for six weeks without discovering common bonds of interest, erasing nationalistic misunderstandings and forming useful foundations on which to build constructively in the future.

One trivial incident may be significant. On Sept. 29 many of the visitors from abroad were guests of William H. Eisenman, executive secretary of ASM, and Mrs. Eisenman at a delightful outing at their Sunnimoor Farm. Just before dinner was about to be served a Japanese conferee was observed in the act of teaching an attentive quartet, consisting of Turkish, Indian, Danish and Brazilian conferees, how to master the art of eating with Chinese chopsticks.

Is it too much to expect that nationals who find it so easy to exchange "know-how" of the order of eating with two sticks will also find ways to exchange "know-how" on improved techniques pertaining to metals? If the first World Metallurgical Congress helps to pave the way for this highly desirable accomplishment, it will be an unqualified success.

E. L. Shaner

EDITOR-IN-CHIEF

NO SELF-SUFFICIENCY: In this issue is a unique chart showing ratios of the self-sufficiency of the United States in relation to 19 minerals. Close examination of this chart should dispel any trace of complacency regard-

ing our mineral resources, because it shows that we are dependent upon foreign sources for about half of the strategic and critical minerals we need.

The United States is self-sufficient in only

two of the 19 minerals—molybdenum and magnesium. It is 100 per cent dependent upon foreign sources for chromite and tin. In the remaining 15 minerals, the United States depends upon imports to the extent of the following percentages: Iron ore 8, zinc 29, copper 34, lead 45, tungsten 52, cadmium 53, arsenic 59, bauxite 63, antimony 79, graphite 80, cobalt 90, mercury 91, manganese 93, tantalum 99 and nickel 99.

These are disquieting percentages. Fortunately, comparisons show that mineral resources of free nations exceed those of communist nations by comfortable margins. Yet these margins do not warrant complacency. —pp. 120, 121

* * *

TWO-WAY EXCHANGE: Many of the metallurgists and metal production executives now visiting in the United States are deeply interested in research. This gives point to the current action of Battelle Memorial Institute, Columbus, O., in establishing Battelle International with headquarters at Zurich, Switzerland. It is expected a portion of Battelle's foreign research activity will be conducted in established laboratories in England, Holland, Germany and elsewhere.

This movement has attractive potentials. European scientists have done marvels in fundamental or basic research. In the United States the emphasis has been concentrated more heavily upon applied industrial research. Battelle plans call for research teams from the United States to study European activities and teams from Europe to examine the American method of operation. This two-way exchange should prove highly beneficial to progress in research on both continents. Basic and applied research need better co-ordination. —p 91

* * *

DIVIDING THE DOLLAR: When a major prime contractor lands a large defense order, how much of the dollar value of that order does he retain for his services? Case studies reveal interesting answers to this question. Of the "Air Force dollar" paid to Boeing Aircraft Co. on prime contracts for making B-47 jet bombers, C-97 Stratofreighters and B-50 piston engine bombers, 42.1 cents goes to subcontractors; 25 cents goes to the suppliers of materials, parts and services; and the remaining 32.9 cents is retained by Boeing for its own work. Figures from some other prime con-

tractors show somewhat similar distributions of the contract dollar. The figures also show that from 50 to 90 per cent of subcontractors and suppliers are "small" businesses. —p. 92

* * *

PROGRESS IN THE RUHR: In 1950 steel ingot output in Western Europe was as follows: Great Britain 18.3 million tons, France and Saarland 11.7 million tons, the Ruhr 10 million tons, and the Benelux union 7.2 million tons. Probable production in 1951 will be 15.5 to 16.0 million tons for Great Britain, 11 to 12 million tons for France and the Saar, 12.2 million tons (the legal limit) or more for the Ruhr, and 10 million tons for Belgium and Luxemburg.

Comparisons show a definite decline in Great Britain and gains in France-Saar, the Ruhr and Benelux. But more important is the fact that gains in the Ruhr are enough greater than gains in France and the Saar to place the former ahead of the latter in total output in 1951. Also Benelux has gained impressively.

The phenomenal recovery of Western Germany, as evidenced by the performance of the Ruhr, intensifies French suspicions of allied post-war policy. Our Atlantic pact is confronted with delicate problems. —p. 97

* * *

LONG VIEW PROMISING: Market analysts of motordom are optimistic over the long-term trend in demand for automobiles. Because of this optimism, auto builders are more than willing to spend their money for new plants and equipment for defense, knowing full well that after the requirements for defense have been met, the facilities can be utilized for peacetime production of automobiles, trucks and busses.

This line of thinking is significant because the automotive industry already has demonstrated that it has a tremendous capacity. True, actual production in a calendar year has been slightly over 8 million units, but there have been occasions when assemblies topped 200,000 units weekly. This indicates a potential capacity of over 10 million units a year.

To turn out 200,000 units weekly with existing capacity involves overtime, shortcuts, expedients and too many headaches. Motordom thinks it needs more capacity to satisfy expected peacetime demand on a more orderly basis of operations. —p. 101

Business Outlook: Mostly Good

Based on the bellwether gray iron foundry industry's experience, prospects are excellent for all except manufacturers with little or no defense work

BUSINESS WEATHER: Bright and promising over coming months in most areas; scattered showers for makers of consumer durables and for those manufacturers with little or no defense work.

You can get a look at the future climate for metalworking by studying what's happening in the barometric gray iron foundry industry now. That industry serves as a first-rate economic indicator because castings must be ordered by finished product makers months in advance, because castings are used in such a wide range of products and because the industry's defense work probably averages 30 or 40 per cent of its total volume, a proportion close to the average ratio in metalworking generally.

Still Good—Although some gray iron foundries have been paring their operating rates, the industry will produce a record 15 million tons of castings in 1951 (see chart). The peak performance is made possible by shipments of a sensational 8,106,000 tons in the first six months. That height won't be reached in this half, but shipments will still be excellent, nearly 7 million tons. The easing in this second six months is caused almost entirely by the diminishing demand from producers of automobiles, appliances and other consumer durables.

Gray iron foundries' experience with consumer durable demand indicates that other suppliers to manufacturers of those goods can expect

sluggish going in that sector. But the drop in requirements should not be disastrous for the total business of stampers, nut and bolt makers and other manufacturers of components for civilian goods, judging from the way gray iron foundries are making out.

Their backlogs of orders still average between two and three months, compared with the highest backlog of three and a half recorded at the end of last February. Total industry sales this year may reach \$4 billion, in contrast to about \$3 billion in 1950. Heavy gray iron castings are in NPA's Group I classification for metals in very short supply. Order backlogs for castings over 3000 pounds are far more extended than the average two months. Light and intermediate weights of gray iron castings are in NPA's Group III—in fair to good supply. Good deliveries are possible on most light castings.

Looking Up—Partly because of the easing pressure in business, gray iron foundries are finding the raw materials situation slightly improved. Coke is in good supply, and stockpiling is going on now in preparation for winter. Cast scrap supplies are tight, but a shade better than a month ago. Steel scrap is as difficult to obtain as ever. Pig iron is also a problem. Scattered foundries across the country have been counting on imported iron to help them out, but the prices are getting out of reason. Austria has been offering foundry

iron at \$83 duty paid in cars, Philadelphia. Some shops have been getting Canadian iron at \$73 to \$75 a ton. A record 1 million tons of pig iron may be imported in 1951, but only about 10 per cent of it is of foundry grade. Alloys that are tough to get include nickel, copper and molybdenum. Ferrosilicon is getting tighter. Chromium is getting easier.

The major priority buyer of castings is the machine tool industry. General machinery and equipment industries and ordnance follow. Shops catering to machine tool builders find themselves in enviable shape now, since as much as 98 per cent of their business is for defense or defense-supporting programs.

Many of the farsighted gray iron foundrymen think the full extent of defense subcontracting has not yet been felt. They believe that when maximum-scale rearmament is at last a reality business will be better than ever.

"Birthmarked" Steel Next?

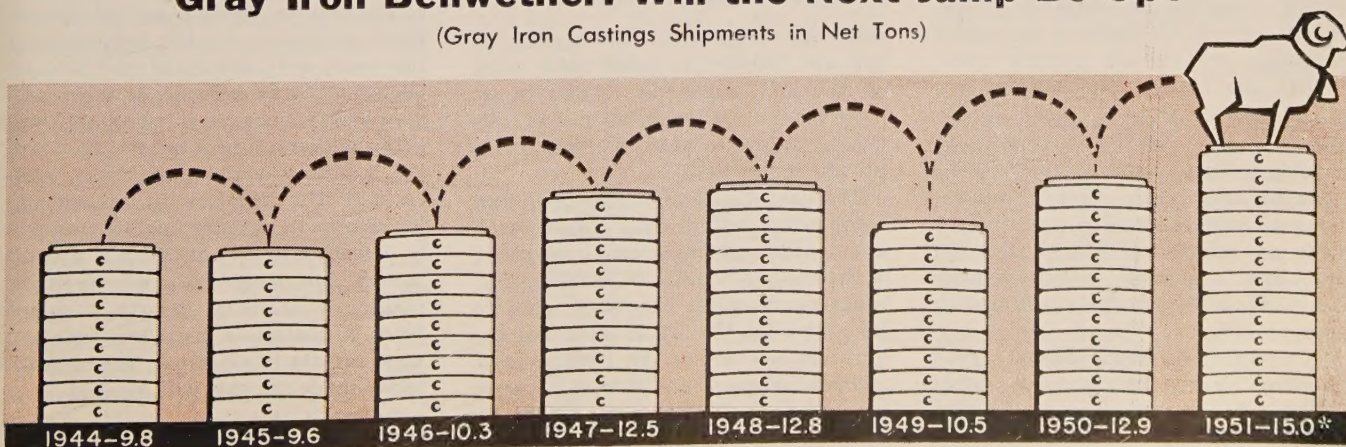
Committee is named to study continuous marking of alloy steels for better identification

PROPOSALS to "birthmark" alloy steels at the producing mills, by such means as continuous ink stamping, in the interests of uniform, positive identification throughout distribution and processing channels, are being given serious consideration by interested groups.

Originating in the West Coast aircraft industry, largely through the efforts of E. H. Chandler, North American Aviation Inc., Los Angeles, the idea (STEEL, Dec. 25, 1950, p. 54) was batted around recently at a special meeting of the conservation

Gray Iron Bellwether: Will the Next Jump Be Up?

(Gray Iron Castings Shipments in Net Tons)



Source: U. S. Bureau of Census. *Estimated.

co-ordinating committee of the DPA in Washington.

Action — In attendance were 41 representatives of steel producers, aircraft and automotive industries, warehouses, technical and standards associations, Munitions Board and the iron and steel division of NPA. Upshot was appointment of a committee of six to report within three months on: What type of marking should be adopted; what classes of steels are to be marked; who is to do the marking; and where it is to be done.

The committee roster: Franklin P. Huddle, chairman, with the conservation division of the Munitions Board; C. E. Miller, U. S. Steel Corp., Pittsburgh, representing steel producers; W. J. Pannier Jr., Pannier Corp., Pittsburgh, representing the marking industry; F. W. Krebs, Super Steels Inc., Cleveland, representing warehouses; Capt. Floyd B. T. Myhre, secretary of the committee on marking of steel for the National Security Industrial Association; and R. E. Dawe, North American Aviation Inc., representing the aircraft industries.

Disagreement — There was by no means any unanimity of opinion on the question of alloy steel marking and it is recognized that the project may be a long-range one until present thinking changes. Everyone appeared to agree that mill marking would add to the cost of steel and this was a major objection on the part of some users, particularly the automotive industry, since it was assumed the added cost would have to be borne by the users. On the other hand, this would obviate the need for individual marking systems, would minimize the paper work involved in keeping track of different grades of steel, simplify the problem of scrap segregation, avoid troubles incident to unidentified surplus steel getting into wrong channels, etc.

Steel mills believe the total cost of marking would be less if done at some central location rather than at their mills in small lots. This, however, would necessitate a central depot devoted entirely to marking assembled tonnages and would greatly complicate the distribution pattern.

Support — Military agencies are strong for a system of continuous marking. They point to steel stocks built up in foreign countries during the war and returned to this country with no semblance of identification left and requiring either tedious chemical and physical testing, or scrapping.

Warehouse interests, except those handling primarily aircraft alloy steels, are inclined to go along with present marking (painting) or tag-

ging systems. Automotive companies reported complaints over mixed steels have been negligible and are opposed to anything which would add to the cost of steel. The railroad industry supports some sort of continuous marking system, noting that about half its steel requirements are not marked and this causes confusion in materials handling for maintenance projects which consume about 80 per cent of all steel used.

Proponents of the continuous uniform marking system suggest a start with only cold-rolled and cold-drawn alloy steels, feeling that the problem is more critical with these materials than with the more common analyses in the hot-rolled varieties.

Identifying Steel by Certificate

The problem of alloy steel identification is getting increasing attention.

Capt. E. I. McQuiston, assistant to the vice president in charge of man-

ufacturing, American Machine & Foundry Co., has a remedy, applicable to defense work, that does not involve extensive marking. He proposes:

"Certain responsible warehouses could be bonded by the government or the Armed Services. Under this bond arrangement, all steel in stock bins would carry the certification of the mill as to its chemical and physical properties. The warehouseman could then duplicate the certificate or certify to the purchaser with a rated order that the material meets the specifications, and, a big provision, that the technical bureaus and inspection services would accept this certificate or certification."

Captain McQuiston was for five years inspector of naval material for the New York area. He believes that all that's required in his plan is acceptance by the Armed Services of the fundamental principle and a directive from NPA to put it into effect.



THE PACE PICKS UP IN POWERED INDUSTRIAL TRUCKS
... it should be even faster in 1952

Lift in Truck Sales

Volume for the powered handling truck in 1951 promises to be double the 1950 level

THE HIGH cost and scarcity of labor are helping to push 1951 sales of powered industrial trucks to at least double the 1950 level. The volume is bound to show continued improvement in 1952.

The need for the materials handling equipment means sales may reach about \$125 million in 1951, compared with about \$50 million in 1950. The industry thus far has been able to keep up with the lift in sales, but the question now is meeting 1952 demand.

Three Ways—The industry hopes to meet the situation in three ways: By getting more materials through an

increased proportion of defense orders, by standardizing more and by some plant expansion.

Industrial truck makers today are devoting about 65 per cent of their production to defense or defense-related programs. At the beginning of the year, only about 15 per cent of output went to defense. If that ratio goes even higher—and it probably will—the manufacturers believe they will get a better deal on materials allocations. The industry is intensifying its efforts to standardize its products to boost output, but there's a limit to how far it can go. As long as old plants or facilities poorly designed from a materials handling point of view remain in existence, the need for tailor-made trucks will remain.

Industry Anatomy — Nearly 30 companies in the U. S. make gaso-

line and/or electric industrial trucks and tractors. About 16 account for most of the production. Some 2.4 gasoline-powered units are made for every electric truck, but the electric-powered units are usually designed with bigger capacities. The major buyer today is probably the auto industry, both for its defense and civilian business. The largest purchasers with priorities seem to be aircraft and companies beginning aircraft parts manufacture.

There are five types of powered industrial trucks: The low lift platform, the high lift platform, the fork unit, the load carrier (hand pushed but with power attachments) and the tractor and crane trucks. Biggest seller is the fork truck; tractor and crane trucks account for only about 2 per cent of total volume. Some manufacturers are trying to avoid a World War II pitfall when, because of the pressure of events, too many of the wrong kind of units were sold. Fork trucks, especially, were oversold.

Fanning Effect—The dollar sales effect on the economy of industrial truck production is far greater than just the \$125 million volume would indicate. That's because truck accessories—pallets, skids, trailers, battery charging equipment and other ancillary equipment will account for six to eight times as much in 1951 metal-working sales as the actual truck shipments. In 1950 when about \$50 million worth of trucks were built, an estimated \$350 million additional was realized in sales of ancillary equipment to accommodate the loads handled by trucks.

Copperweld Buys Flexo

Purchase of Flexo Wire Co. Inc., Oswego, N. Y., was made by Copperweld Steel Co., Glassport, Pa., which will operate Flexo as a wholly owned subsidiary.

Flexo has been a producer of small and fine sizes of Copperweld, copper and bronze wires and cables with a capacity of more than 500,000 pounds a month. Copperweld will utilize Flexo's production facilities for immediate production of small and fine sizes of copper-saving Copperweld wires and cables for the electronics and electrical appliance industries. Flexo also will continue to produce certain sizes and types of copper and bronze wires and cables.

Copperweld's action in acquiring Flexo's business, says Copperweld's president, Frank R. S. Kaplan, is indicative of growing interest in Copperweld wire as a copper-saving alternate for copper in pigtail leads for condensers and resistors, hook-up wire and power cords for radio and television sets.



WATER IS THE IMPORTANT THING: Engineers study operation of metal pan conveyor which carries off stones screened from the gravel used for Downville, N.Y., dam. The Hewitt-Robins conveyor, 48 inches wide and 110 feet long, handles rocks as heavy as three tons. Scheduled for completion in 1954, the project will dam the East Branch of the Delaware river as a step in rebuilding the Pepacton Reservoir, which will result in 300 million more gallons of water daily for New York City

Bridgeport Brass Enters Aluminum Field

The company will buy ingots from large aluminum producers for melting down and conversion. The move was dictated by the shortage of copper and zinc

SHORTAGE of copper and zinc is forcing brass and copper mills further into the aluminum fabricating field.

Latest move is by Bridgeport Brass Co., Bridgeport, Conn., which is going to start converting aluminum ingots into finished products. The company will buy ingots from the large aluminum producers for melting down and conversion into aluminum alloys in various semifinished forms. Semifinished would be processed further into products such as sheet, rod and wire.

A Natural—Bridgeport, large independent brass and copper mill, is dependent on the producers of copper. Because of the copper and zinc shortage, fabricators dependent on others for a copper supply have been turning to alternate materials. Fabrication of aluminum is quite similar to that of copper and brass products and fits in well with copper and brass mill equipment and operations for the most part.

Bridgeport Brass says the supplementing of its brass and copper mill production with aluminum will not

mean any broad program of plant and equipment expansion now.

The Trend—Some of the copper and brass mills have been in the aluminum business in varying degrees for some time. Bridgeport Brass has acted as a sales agent for aluminum sheet; another independent, Scovill Mfg. Co., Waterbury, Conn., has been cold-rolling aluminum sheet into various gages; and a third independent, Revere Copper & Brass Inc., New York, has been melting aluminum ingot and converting it into finished products.

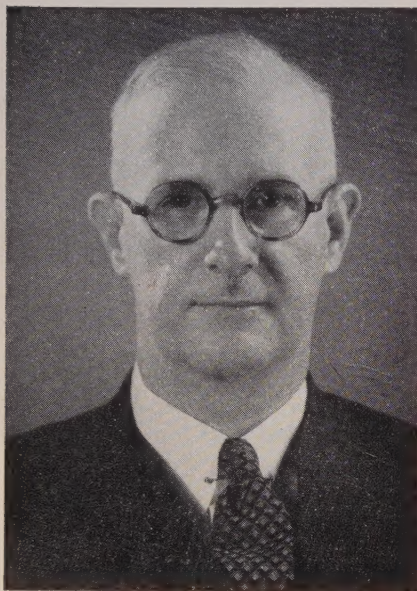
In announcing its new venture, Bridgeport Brass says: "With the present huge demand for copper and zinc for defense purposes, the long range outlook for added sources of supply of these semi-precious metals is such that it is wise for the company to supplement its present field of operations." This action is akin to that which Defense Production Administrator Manly Fleischmann suggested last week. He said the outlook for a copper supply is such that users of copper should consider switching to some other material.

Administrator-Engineer

Dual role is increasingly important, Inland official tells iron, steel engineers

ENGINEERS must learn to administer as well as engineer.

Increasingly, administration is becoming a legitimate engineering function, says Inland Steel Co. Vice President Hjalmar W. Johnson, because "our processes are becoming more and more complicated and the job



I. N. TULL

... '52 president, AISE

of co-ordinating all the specific technical processes and skills more and more important." He spoke last week before the annual convention of the Association of Iron & Steel Engineers in Chicago.

Or Else—Engineers who shirk the responsibility of administration, Mr. Johnson believes, will see their professional stature erode away as the job is taken over by others skilled in administration. He says engineers with intimate knowledge of the essentials of construction and operation can make tremendous contributions to the organization of men and processes and the selection and training of personnel.

During the business session I. N. Tull was elected president of the association for the calendar year 1952. He is electrical superintendent of the Cleveland district of Republic Steel Corp. and also chairman of that company's electrical committee. John L. Young, vice president-chief engineer of United States Steel Co., was elected first vice president. Second vice president will be E. L. Anderson, electrical superintendent of Bethlehem Steel Co. at Johnstown, Pa. John H. Vohr

has been elected treasurer. He is the general superintendent of the Gary Steel Works of United States Steel Co. W. H. Collison, superintendent of the coke plant, Great Lakes Steel Corp., becomes secretary.

Winners—The board of directors announced the winning AISE Kelly Award Papers for 1950. First prize went to E. T. Lorig, U. S. Steel, for his paper on "Automatic Self-Centering Rolls and Pulleys." Carl G. Hogberg, United States Steel Corp. of Delaware won second prize with his paper entitled "Technical Aspects of Northern and Southern Blast Furnace Practice." Another blast furnace paper took third prize which was awarded posthumously to Frank Janeczek, former blast furnace engineer of Republic Steel Corp. for his paper, "Five Years of Blast Furnace Operation Under Elevated Top Pressure."

Among runners-up in the competition was Ross E. Beynon of U. S. Steel Co. for his paper, "Pass Design of Angular Sections." Mr. Beynon has been runner-up or has won one of the Kelly awards ever since they were established in 1943 to honor John F. Kelly, managing director of AISE from 1917 to 1934. Other runners-up included C. W. Barrett of Republic Steel Corp. and Andrew F. Kritscher of National Tube Co. The Kelly award carries prizes of \$300, \$200 and \$100 for first, second and third places, respectively.

Joy To Build Coal Machine

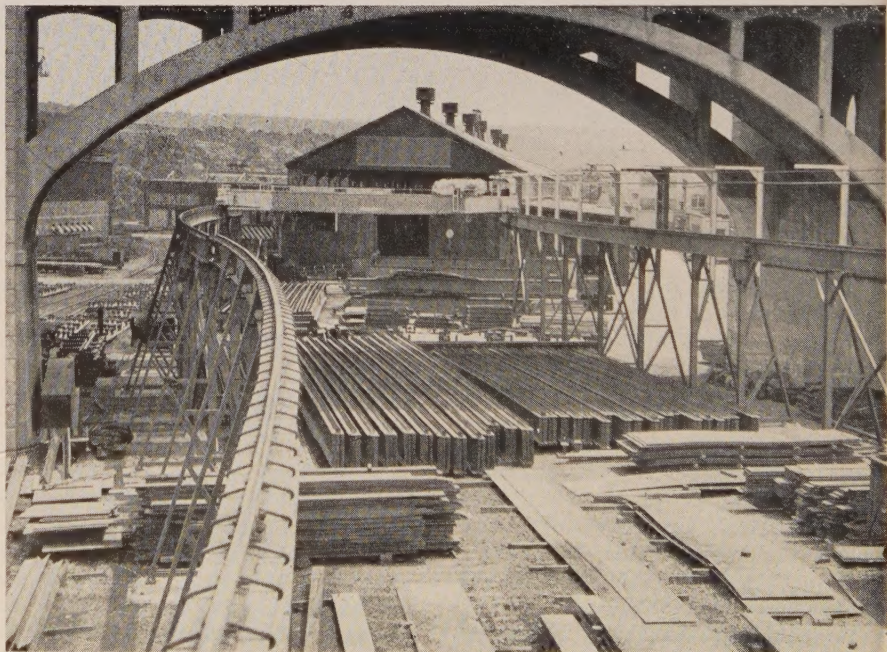
Joy Mfg. Co., Pittsburgh, has made an agreement with Bituminous Coal Research Inc. covering exclusive rights to certain features of a flexible steel shaker conveyor on which Joy previously had applied for basic patents.

Joy will now build commercial models of the new shaker conveyor, embodying the best features of both BCR and Joy designs. The conveyor is equipped with an extensible stainless steel belt. One end of the belt unwinds off a spool to follow the continuous mining machine as it digs its way into the coal face. When not in use, it is rewound and stored in a spool or drum. The belt is long enough to permit the mining machine to advance 300 feet or more without interrupting the flow of coal to the outbound haulage system.

September Employment Drops

Employment turned downward as usual between August and September, as student workers left their summer jobs to return to the classroom.

Estimated at 61,580,000 in the week ended Sept. 8, total civilian employment was about 1 million under the August level, according to the latest Census Bureau figures. Nonagricultural employment fell to 54,054,000 in September from 54,942,000 in August; teen-age youngsters accounted



SANE AND SOBER: What is said to be the only crane runway with a reverse curve belongs to Lehigh Structural Steel Co., Allentown, Pa. Extension of the crane runway was needed to enable the company to make maximum use of its yards north of the bridge. Yet a straight-line extension would have been halted by the pier of the highway bridge which spans the Lehigh river. Two sets of wheels of different diameters on the end of each axle on each end of truck, specially built crane cabs, and the reverse curve did the trick

for virtually all the change. Unemployment, estimated at 1,606,000 in September, remained almost unchanged from the previous month. Agricultural employment, estimated at 7,526,000 in September, showed little change from August.

Caterpillar Back to Work

A two-month strike at Caterpillar Tractor Co., Peoria, Ill., has ended and the plant is again producing at full capacity. Company and Union (CIO-UAW Local 974), agreed to an across-the-board increase of 13½ cents per hour for employees in the bargaining unit and a cost-of-living wage adjustment next February. The agreement is being submitted to the Wage Stabilization Board. This longest strike in Caterpillar history caused an estimated loss of \$75 million in sales and \$18 million in wages and local purchases. More than 22,000 production employees were idle during the strike.

Research Plan Set in Europe

Battelle Memorial Institute, Columbus, O., is now setting up Battelle International, with headquarters probably to be at Zurich, Switzerland. Dr. Clyde Williams, director, will go to Europe later this month to join John Crout, Dr. B. D. Thomas and W. R. Keagy, his assistants, who have been in Europe for some weeks working on final arrangements.

Ultimately it is expected that Battelle International will maintain laboratories and offices in several European countries. It is also anticipated that a portion of its research activity will be conducted in existing laboratories such as the Fulmer Research Institute in England, the TNO Council in Holland and the Max Planck Gesellschaft in Germany. Financial support for research programs will come from industrial sponsorships, both American and European, and from Battelle's endowment.

As pointed out by Battelle's R. R. Adams, European science has developed to its highest degree in the field of fundamental or basic research, while American science has been more concerned with applied industrial research. It is expected that an amalgamation of these two techniques will result in a significantly higher level of research benefits to all concerned.

Plans also call for the dispatch of teams of scientists from the Columbus laboratories to these international centers to work with European researchers for limited periods of time. In the same way, groups from European laboratories will travel to this country to study industrial research techniques.

Tool Distributors Meet

AMTDA members hear Tigges, Bergstrom, Berna at 27th annual meeting

THE COMBINATION salesmen-engineer-diplomats of the American Machine Tool Distributors Association heard chorused pleas for more—and more productive—machine tools at their 27th annual meeting in Atlantic City last week.

At a heavily attended meeting (260 members and guests representing about 100 of the 166 member companies were present) they heard such speakers as Lt. Gen. Orval R. Cook, deputy chief of staff, Materiel, U.S. Air Force; Herbert L. Tigges; Swan E. Bergstrom, who will succeed Mr. Tigges as director of NPA's Metalworking Equipment Division; and Tell Berna, general manager of the National Machine Tool Builders Association.

Never Before—AMTDA members, whose production and tool engineering know-how is used in adapting old and new machines to new and unfamiliar uses in production of weapons, ammunition and aircraft, heard about some of the latest techniques. General Cook told them about the machining of ribbed wing sections from solid aluminum alloy plates and aircraft instrument work that surpassed in accuracy and complexity any watch making or instrument making encountered before.

A. R. Eckberg, manager, Engineering and Maintenance, of Eastman Kodak's Kodak Park Works emphasized how existing machines could be adapted to unusual uses. His outstanding example was that of converting old lathes to the milling of apertures in range-finder tubes.

Afterward, What? — Tell Berna predicted marked improvement in machine tool deliveries in the months ahead. Looking even farther ahead, he pointed to the possibility of foreign machine tools being imported into this country in large numbers having a serious effect on future foreign markets. While admitting that "what is best for the people of the United States is the thing we must work and fight for," he thought the foreign tools would involve serious service and repair problems. AMTDA members who attended the Paris machine tool show not long ago agreed. Some said obviously impossible delivery dates were being quoted.

The distributors were also looking way ahead. One session was on the selection and training of machine tool salesmen. And Frank Bettger, author of the recent "failure to success" best seller, told of the

importance of enthusiasm in selling.

New Officers—AMTDA's new officers are:

President, E. J. Seifreat, president of Seifreat-Elstad Machinery Co., Dayton, O.

First Vice President, John M. Riordan, president of Riordan Machinery Co., Detroit.

Second Vice President, Edwin R. Motch, Jr., president of Motch & Merryweather Machinery Co., Cleveland.

Secretary-Treasurer, George B. Mc-



E. J. SEIFREAT

... AMTDA '51-'52 president

Clennen, a partner in Delta Equipment Co., Philadelphia.

New members of the executive committee are: Manus F. Campbell, president of Peninsula Machinery Co., Detroit; J. D. Germain, general manager of Eccles-Germain Machinery Co., Los Angeles; L. M. Wiertz, general manager of F. F. Barber Machinery Co., Toronto; and J. F. Owens Jr., partner and general manager, J. F. Owens Machinery Co., Syracuse, N. Y.

RFC Gives up Foote Bros. Stock

Reconstruction Finance Corp. is no longer largest single owner of common stock in Foote Bros. Gear and Machine Corp., Chicago. The company bought up 28,927 shares held by RFC since 1936, and will ask stockholders to approve retirement of those shares in order to put through a three-for-two split of common stock. RFC never took part in management of Foote Bros. It realized, through retirement of 21,913 shares of preferred stock and from dividends, a sum sufficient to liquidate the original loan at a substantial profit.

Fired Up on Safety?

An industry that can't increase your production may do much to lower costs of down-time if a fire breaks out in your plant. It's the 40-company fire extinguisher industry (making hand and wheeled type portable first aid fire extinguishers), which is having its materials problems, as is everyone else. With some it is getting steel, with others copper, brass, lead and tin. And materials alternates are as rough a problem with them as it is with capital equipment makers. Says Walter Kidde & Co., because of the peculiar nature of fire extinguishers they must stand up against corrosion over many years and with relatively little care. Too, most units must be able to withstand terrific pressures.

Thought about civil defense program has had little effect on the industry but has helped the sales of some other types like built-in systems for industry. There is little doubt that the industry's volume, which was in the doldrums two years ago, will be increased by the mobilization effort. But many manufacturers of the equipment think if a civilian defense program is developed, it won't affect their industry too much; they believe a renewable pump type extinguisher will again be manufactured.

One thing fire extinguisher manufacturers can look to for greater volume is the publicity being given this week by the National Board of Fire Underwriters to the cause of safety: Oct. 7 through 13 is National Fire Prevention Week.

Defense Department Tallies Up

Totaling up its obligations for the first two months of the Fiscal Year 1952 (July and August, 1951), the Department of Defense reports \$6.9 billion spent for procurement of major equipment, supplies, military construction and expansion of production facilities. Obligations include firm contracts, financed portions of accepted letters of intent and project orders with shipyards and arsenals.

Procurement of "hard goods" (aircraft, ships, tanks, weapons, ammunition, production equipment, electronics and other equipment) amounted to \$6.1 billion, and "soft goods" procurement (clothing, subsistence and petroleum) totaled \$0.5 billion and construction \$0.3 billion.

For the 14 month period following the attack on Korea, the Department of Defense has obligated a total of \$42.1 billion for procurement and construction: \$35.6 billion for "hard goods", \$4.5 billion for "soft goods" and \$2.0 billion for construction.



BIG RESPONSE: A large attendance record was set by the Military Business Opportunity Display held in Los Angeles, Sept. 18-21 when 10,895 businessmen seeking subcontracts were attracted to the displays. Eighty-two prime contractors exhibited items to be farmed out

Subcontractors' Teamwork Makes Defense Jobs Click

MAKE no mistake—the small defense jobs are vital to the success of the defense program. Extra effort in finding and easing the way for subcontractors in the past few months indicates that the Armed Forces and most prime contractors appreciate and need the contributions of small business.

Case Study—The aircraft industry is a good example of the teamwork being used on defense contracts. Of the more than 60,000 subcontractors and suppliers of prime Air Force aircraft producers, 52,200 or 87 per cent are small business firms. Of the four largest prime aircraft contractors, Lockheed Aircraft Corp. will distribute \$3 million, or 127 per cent more than 1950, to subcontractors and suppliers; Douglas Aircraft Co. will pay out 46.7 per cent of its sales dollars to subcontractors and suppliers this year, and 3650 of its 4000 subcontractors and vendors will be small businesses; the aircraft division of Pratt & Whitney will spend \$2.5 million among 5285 subcontractors and suppliers for 30,000 parts, and 90 per cent of these companies are small business firms; and finally, Boeing Airplane Co. is currently subcontract-

ing 42.1 per cent of the dollar value of its prime contracts for making the B-47 jet bomber, the C-97 Strato-freighter, the B-50 piston-engine bomber, and in addition 25 per cent goes for parts or raw materials.

Good Share—General Electric Co. has a first team of 17,000 subcontractors and suppliers to which GE will pay more than 50 per cent of the \$5.5 million in defense contracts it now holds. Many of these 17,000 companies in turn deal with thousands of other small businesses. More than 4000 suppliers contribute to GE's production program of the J-47 jet engine, and last year took 60 per cent of the program's dollar volume.

Another major subcontract in other than the aircraft field was announced when Consolidated Western Steel Corp., subsidiary of U. S. Steel Corp., received a \$13-\$15 million subcontract to produce hulls for personnel carriers for the Army. The finished hulls will be shipped to Food Machinery & Chemical Corp., San Jose, Calif., the prime contractor, for final assembly.

Other contracts awarded by the government, in excess of \$250,000, follow:

Product	Contractor
Concrete Spreaders	Blaw-Knox Co., Pittsburgh
Road Graders	Rome Grader Corp., Rome, N. Y.
Crushing Plants	Iowa Mfg. Co., Cedar Rapids, Iowa
	Pioneering Works Inc., Minneapolis
Post Office Trucks	Fargo Motors Corp., Chrysler Corp., Detroit
Gun Carriages	Baldwin-Lima-Hamilton Corp., Eddystone, Pa.
Refrigerators	Franklin Transformer Mfg. Co., Minneapolis
Antenna Masts	Modcraft Co. Inc., Brooklyn, N. Y.
Periscope Mounts and Related Equipment	Gilbert & Barker, West Springfield, Mass.
Radio Receivers, Test Set Kits	Philco Corp., Philadelphia
Rawin Sets	General Electric Co., Schenectady, N. Y.
Crystal Units	Pacific Electronics, Saticoy, Calif.
Flashlights	Bright Star Battery Co., Clifton, N. J.
Projectiles, 20 MM	Pantex Mfg. Corp., Pawtucket, R. I.
Brass Cartridge Cases	Norris Thermador Corp., Los Angeles
Metal Parts for Mortar Fin, 81 MM	Precision Castings Co. Inc., Syracuse, N. Y.
Spare Parts for Fire Control Equipment	Arma Corp., Brooklyn, N. Y.
Washers, Shackles, Clips	Graybar Electric Co. Inc., New York

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of NPA news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Controlled Materials Plan

IMPORTED STEEL—Amendment of Sept. 28, 1951, of Direction 4 to CMP Reg. 1 permits a steel consumer to use imported steel to manufacture more products than the quantity shown on his authorized production schedule, whether or not the user or the person from whom he purchases the steel obtains title before the steel reaches the U. S. Prior to this action, this authority was granted only in the case of imported steel, the title to which was taken by the consumer before the steel reached the U. S. Under this amendment, effective Sept. 28, a person who uses imported steel purchased from the broker or importer who takes title to it before it arrives in the U. S. need not deduct the tonnage from his allotment of controlled materials.

UNDELIVERED MATERIALS—NPA action on Oct. 1, 1951, requires a consumer to charge to his fourth-quarter CMP allotment any unfilled order calling for third-quarter delivery but which was not shipped by Oct. 7. This action was accomplished by amending CMP Reg. 1, and issuing Direction 7 to CMP Reg. 1, Direction 3 to CMP Reg. 6,

and Direction 3 to NPA Order M-5. Previously, an authorized controlled material order accepted by a mill for delivery during the third quarter might be filled at any subsequent time and still be charged against a third-quarter allotment.

Materials Orders

CONSUMER DURABLES—NPA Order M-47B, effective Oct. 1, 1951, permits flexibility in the use of steel, copper and aluminum for output of consumer durable goods. M-47B, which succeeds M-47A, allows a manufacturer of products listed in the order to shift his production for any calendar quarter from one product to another in the same group.

FERROALLOYS—The NPA on Oct. 1, 1951, revoked seven orders controlling distribution and uses of critically short ferroalloying materials. These revoked orders have been superseded either by NPA Orders M-80 or M-81. The nullified orders are M-3 (columbium and tantalum-bearing steels); M-10 (cobalt); M-14 (nickel); M-30 (tungsten); M-33 (molybdenum); M-49 (columbium and tantalum); and M-52 (molybdenum-bearing steels).

COPPER—The NPA on Oct. 1, 1951, revoked its order M-12 and Directions 1 and 2 to that order which limited the use of copper and copper-base alloys. Controls on these are now embodied in orders M-47B (use of steel, copper and aluminum), M-4 (construction), M-74 (building materials), CMP Reg. 5 (MRO), and CMP Reg. 2 (inventory restrictions).

FARM EQUIPMENT—The NPA on Oct. 1, 1951, revoked its order M-55A and Direction 1 thereto. They provided interim relief to farm equipment makers, who now are covered by CMP.

COMPONENTS—The NPA on Oct. 1, 1951, revoked its order M-60 and Direction 1 thereto. They provided interim relief to components makers, who now are covered by CMP.

MACHINE TOOLS—The NPA on Oct. 1, 1951, revoked its order M-61 and Direction 1 thereto. They provided interim relief to machine tool producers, who now are covered by CMP.

MARINE MRO—Amendment of Oct. 1, 1951, of NPA Order M-70 extends into the fourth quarter the priority assistance NPA has given for procurement of marine maintenance, repair and operating supplies and minor capital additions by ship operators, marine suppliers and ship repair yards.

Price Regulations

IMPORTS—Ceiling Price Regulation 31 governing imports is republished to incorporate the text of Amendments 1 through 9.

NEW MANUFACTURERS—Amendment 16 of Ceiling Price Regulation 30 permits new manufacturers who cannot determine ceiling prices under the machinery ceiling price regulation (CPR 30) because they were not in business before Jan. 1, 1950, to apply to the

Office of Price Stabilization for approval of proposed ceilings.

CONVERSION STEEL—Amendment 28 of Ceiling Price Regulation 22 and Amendment 15 of CPR 30 permits manufacturers to raise their ceiling prices to reflect increased costs of using more conversion steel than they did before the Korean war. The amendments were effective Oct. 2, 1951.

COKE, CHEMICALS, GAS—Amendment 4 of Supplementary Regulation 13 of the General Ceiling Price Regulation extends to midnight Dec. 31, 1951, the expiration date of SR 13 which permits producers of all grades of coke, coal chemicals and coke oven gas to adjust their ceiling prices to reflect increased delivered costs of raw materials.

CASTINGS—Amendment 2 of Ceiling Price Regulation 60 extends the effective date of the Office of Price Stabilization's ceiling price regulation on metal castings from Oct. 1 to Oct. 26, 1951.

ALUMINUM SCRAP—Amendment 1 of Ceiling Price Regulation 54 modifies the Office of Price Stabilization's aluminum scrap ceiling price regulation with respect to sales of wrecked aircraft by the U. S. government.

LEAD, ZINC—Supplementary Regulation 70 to the General Ceiling Price Regulation adjusts ceiling prices for slab zinc and primary lead produced in the United States, its territories or possessions. SR 70 was effective Oct. 2, 1951.

LEAD, ZINC—Supplementary Regulation 71 to the General Ceiling Price Regulation establishes the ceiling price for foreign slab zinc and foreign primary lead at the level of the adjusted ceiling prices for similar domestic products. SR 71 was effective Oct. 2, 1951.



LOTS OF TIME—PIECES: Stamping the serial number on a part of the 50 millionth precision watch to be made by Elgin National Watch Co., Elgin, Ill., the young lady helps Elgin reach a goal hailed as a first in the world's horological industry. Included in the first jeweled time-piece to bear a serial number in the 50-million bracket are Elgin's new non-corrosive alloy escape wheels



TRAFFIC JAMS ARE HELPFUL: A 15-jeweled auto watch, which is wound by the motions of the car, is appearing on two of Oldsmobile's 1951 models and being marketed as a novelty item in New York. Its inventor, Zvonko M. Maar, of Zurich, Switzerland, holds the winding mechanism in his left hand. The winding mechanism fitted together is in the left foreground

Windows of Washington

Need money to finance a defense project? One source may be a government V-loan. U. S. has already passed out more than \$1 billion on 650-700 applications

GAINING STATURE after a year of operation, the government V-loan program promises to approach the size of its World War II predecessor. It has already passed the \$1 billion mark in loans approved on some 650-700 applications by industries engaged in defense work.

Between 1942 and 1945, its counterpart allocated \$10 billion on 9000 authorizations (and earned \$25 million profit for the guaranteeing agencies — Army, Navy, Maritime Commission). With arms orders going out at a rate of nearly \$1 billion a week, the V-loan program—one tool for financing defense contracts—is bound to grow fast. Activity hasn't reached down to subcontractors in heavy volume yet, and they're the ones who really need the money.

Branching Out — Nine government agencies are now qualified to certify companies for V-loans. They are: Defense (Army, Navy, Air Force), Interior, Commerce and Agriculture Departments; Atomic Energy Commission; General Services Administration and Defense Materials Procurement Agency.

Procedure in getting a V-loan is simple. The applicant company needing funds to produce on a government contract goes to any private financing institution (local bank, insurance company, etc.), which handles financial aspects of the transaction with the Federal Reserve Board. FRB takes it to the appropriate government agency for certification that the materials furnished or services performed under contract are essential to national defense. The guarantor authorizes the loan and FRB, as fiscal agent, executes it, collecting the guaranty fee and accounting to the agency for it.

Finances—Highest interest rate allowable is 5 per cent. On top of this, the private bank can charge a commitment fee of 0.5 per cent.

Most government agencies are interested primarily in supplying working capital, but General Services Administration will now consider applications for facilities expansion loans. GSA says it will consider a loan for expansion by a machine tool builder even though he has no government contracts,

CMP Under Fire

CMP is hurting small business.

That was the gist of a report on CMP hearings by the House Small Business Committee. The major change recommended in its operation by the report was the shifting of NPA—the proprietor of the program—from the Department of Commerce to integrate it within the Defense Production Administration. DPA was criticised for cutting structural steel allocations to the steel expansion program. A broadside was directed also at NPA compliance regulations for their unnecessarily complex language. Early abandonment of CMP was called for as "controls on materials severely restrict the ability of small business to expand and of new businesses to find a foothold in the economy."

prime or sub. Even a subcontractor or supplier to a tool builder could qualify under this policy. National Production Authority acts as consultant to GSA if an applicant has no contracts with the latter.

New Wage Policy ...

Latest policy of Wage Stabilization Board is to allow lowest-paying firms in a certain industry or area to petition the board for approval to bring wages up to comparable levels of its competitors or neighbors. The inter-plant inequity policy, as it's called by WSB, is involved in more than 1000 cases

in the WSB backlog awaiting policy formulation.

St. Lawrence Seaway Again ...

After two months of relative quiet, the St. Lawrence Seaway and Power Project is again being mulled and mauled by Congress. Latest resolution—by Rep. John A. Blatnik, (Dem., Minn.)—calls for prior agreement with Canada on tolls to be charged, means of exchanging information on annual overhead costs, authorization of the President to negotiate with Canada on setting toll rates, a bipartisan commission to supervise construction, authorizing the Army Engineers to build the U. S. portion, and setting up of a St. Lawrence Fund in the Treasury to facilitate an accurate accounting of costs and performance results. Canada is planning to go ahead with building an All-Canadian channel if the U. S. doesn't approve a joint venture.

Arrivals and Departures ...

Walter C. Skuce, NPA Assistant Administrator for Production Controls, and chief contributor to organization and development of the Controlled Materials Plan, returned to his position with Owens-Corning Fiberglas Corp., Toledo, O. William C. Truppner, Deputy Assistant Administrator for Production Controls since last April, has been appointed acting administrator.

Ernest W. Heilmann, has been designated acting director of the Consumer Durable Goods Division of Office of Price Stabilization.

Robert E. Williams, on leave from Automatic Electric Co., Chicago, is new Director of Communications Equipment Division of NPA.

Machinery Catalog Ready ...

A 1951 revision of the monumental *Directory of Metalworking Machinery* has been published by the Munitions Board and copies are obtainable at \$3.50 from the Superintendent of Documents, Washington 25, D. C.



Authenticated

WHAT'S NEW IN FRANCE: Modern French automobile design is shown in the Simca 9 Aronde. A four-cylinder car, the Aronde can go 75 miles an hour and can make 30 miles on a gallon of gasoline. Its small valve-in-head engine develops 45 hp at 4000
← revolutions per minute

PORTABLE BUILDING: Two French workmen twist tubing to be used in erecting the United Nations Building in Paris, France. The seven-story building, situated near the Eiffel Tower, puts the accent on modern architecture—being entirely dismountable. United Nations General Assembly sessions will be held there in November of this year →



Acme

Schuman Plan—Is It Dying?

Enthusiasm for the proposal to pool Europe's coal and steel resources has ebbed, but it still has a chance of acceptance. The French parliament may vote on it soon

WHAT happened to that Schuman plan to pool European steel and coal resources that caused so much furor when it was introduced nearly 18 months ago?

The proposal is still hanging fire, but the Korean war and the Atlantic pact have stolen the headlines, controversial aspects of the plan have brought second thoughts on the matter and enthusiasm generally has ebbed. The French particularly are uneasy about the resurgence of West German industry and fear that the Germans will exercise undue control over the pool.

Up to a Vote—The French parliament may vote on the issue this month, but the results are uncertain. Approval by all participants' legislatures are required, and ironically the greatest troubles are expected in the parliament of the nation which originally introduced the proposal. Even in May, 1950, when France was not so concerned about German industrial power, a test vote on the issue in the Foreign Affairs Committee of the French National Assembly approved the government's stand by only 18 to 17.

West Germany's steel production this year promises to match or exceed that of France and the Saar combined. Ever since last April, German steel production has taken the lead over the Franco-Saarland combine, and therein lies the reasons for the Gallic alarm. Ruhr output is now ranging from 1 to 1.2 million net tons a month, compared with a production

of slightly less than that in France and the Saar. The Ruhr turned out about 10 million tons in 1950; Franco-Saarland 11.7 million tons. The new German republic is now only nominally limited by the Allies to the legal steel production limit of 12.2 million tons a year.

Ruhr Recovery Is Phenomenal

The recovery in West Germany has been phenomenal. Industrial production is now 30 per cent better than it was in 1936. Exports are moving at the annual rate of \$2.7 billion a year, compared with \$1.4 billion in 1936 for the same geographical area. Employment in 1936 was about 10 million; it's more than 14 million now. Industrial productivity is slightly—but only 4 per cent—below the 1936 level.

But grave problems exist for the republic. Inflation is not checked and a 10 to 15 per cent price increase on high-quality steels had to be granted in September. Coal production is improving slightly, but it's still inadequate.

Labor is still restive and the whole economy has not yet recovered from a four-week strike in Hessen by 100,000 metalworking men who finally returned to work only after a hefty wage hike.

Reorganization of West German steel and coal companies, as decreed by the Allies, is another headache. Of the 28 new "unified" steel companies set up by Allied order, only

13 have thus far been organized. What's more, the Social Democratic party, led by Kurt Schumacher who is considered a demagogue by some Allies, has just introduced a new plan in the parliament to nationalize the coal and steel industries. The party proposes to compensate the owners by means of bonds which pay interest of 2 or 3 per cent. The plan is similar to one backed by unions.

Escalator Index in France

France is moving toward a sliding wage scale tied to the cost-of-living index that would be similar to the General Motors plan in the U. S.

That expedient is being considered because inflation has not been stopped in the country. Minimum wages and salaries will also be raised, to 28 cents an hour or \$57 a month, a 14.9 per cent increase. That will put wages up about 25 per cent from year-ago levels. The increases will scarcely cover cost-of-living boosts. Just in the last month, coal has been increased 20 per cent, electricity 10 per cent and steel 15 to 18 per cent.

French balance of payments with foreign countries will probably be more out-of-joint in 1951 than it was in 1950.

That's partly because of increased coal imports. So great is the need for coal that the nation has been importing at the rate of about 1.2 million net tons a month, compared with average monthly foreign purchases of 825,000 tons in 1950. Major suppliers are West Germany, the U. S., Benelux, Great Britain and Poland, in that order.

Shortages Hamper U.K. Output

Raw materials shortages are putting the damper on British steel production, which is now running at the annual rate of about 15.5 million net

tons, compared with 18.3 million tons in 1950.

The boost in steel prices has caused scarcely a ripple. British quotations are still among the lowest in the world, comfortably below the U. S. levels.

The recent boost in iron and steel scrap prices has been beneficial, for more of the material has come out of hiding. Nevertheless, scrap is still one of the most difficult items for the steelmaker to get. Coal is also dangerously short, not because of lower productivity but because of the scarcity of labor. British coal stocks at the beginning of winter should stand at about 20 million net tons; now they're only about 15.7 million tons.

Autobuilders can't get nearly enough steel, and that factor may dull some of the glitter originally expected for the 36th International Motor show to be held in London, Oct. 17-27. The affair is going ahead on schedule and will contain exhibits from British, American, Canadian and European manufacturers.

Benelux: Active Steel Exporter

The Benelux union remains one of the most active steel exporters in Europe. A heavy foreign business enabled the union's producers to turn out 5.1 million net tons of steel in the first half, compared with 3.6 million tons in the first six months of 1950.

The steel consuming industry is booming, with about 40 per cent of its total output for export. Output of Belgian and Luxemburg products made from steel in the first half is now running at a rate that's 19 per cent better than in the first half of 1950 and 6 per cent better than in the same period in 1949.

More Industrial Diamonds

Larger imports, better salvaging methods brighten the future for users

HOPE for an adequate supply of industrial diamonds is being held out by the NPA to users in this country. Up to now the supply has been very tight, with a consistently rising demand during the first half of 1951.

The hope is based on a promise to ship more industrial diamonds to the U. S. by the London syndicate which controls the lion's share of the available supply. Largest source of industrial diamonds is the Belgian Congo; a major industrial use is in grinding.

A Matter of Price—One reason that American users have had a difficult time wooing an adequate supply toward this country is the controlled U. S. price for the diamonds which ranges from \$1.60 to \$1.80 a carat compared with the \$8 to \$10 paid by Europeans. Ways of balancing supply and demand were discussed at a meeting of the Industrial Diamonds Industry Advisory Committee with the NPA. The group is considering a suggestion for an NPA-sponsored educational program aimed at increasing the use of coolants during grinding operations. Wet grinding with metal-bonded wheels can extend the life of a grinding wheel as much as 400 per cent.

A Matter of Salvage—Assistance of NPA's Salvage Division in developing new methods of recovering industrial diamonds from waste material was requested at the meeting. The industry committee points out that current techniques for reclaiming industrial diamonds permit the recovery of 2½ times as many diamonds as was possible during World War II.

To permit a more accurate forecast of future requirements for industrial diamonds, 1850 questionnaires have been sent to all known consumers and dealers, requesting information on inventories and past usage.

More Auto Scrap This Year

Receipts of auto wrecker scrap may be 30 per cent higher this year than last. Old jalopies given up for junk may add 3.9 million gross tons of scrap to the nation's depleted scrap reserves. The tonnage estimate is based on a sampling of unprepared iron and steel scrap by dealers all over the country and was passed along by Edwin C. Barringer, executive vice president of the Institute of Scrap Iron & Steel Inc.

The Reason Why—The increased receipts result from increased pressure on auto wreckers for the material and because the scrapping of old cars has increased slightly over what it has been at any other previous time since the end of World War II. The higher rate of scrapping is caused primarily by the heavy production of automobiles in 1950 and early 1951. An automobile is kept now about twice as long as it was before World War II. Before the war the average age of cars as they were scrapped was about seven years; now that has been lengthened to nearly 14 years.

Two principal hurdles to be jumped before the volume of auto wrecker scrap can be increased still more are the high labor charge for doing the actual scrapping job and the reluctance of most municipalities to relax their ordinances forbidding the burning of automobile bodies, to eliminate nonmetallic components, within the city limits.



FLYING DESKS: Three large trailers made by Trailmobile Inc., Cincinnati, disgorged their loads of steel desks into an Air Force C-124A Globemaster II for shipment to Castle Air Force Base, Merced, Calif. The Trailmobile trailers, carrying a 20,800-pound consignment of 72 steel desks,

were backed up into the nose of the huge cargo plane and unloaded in less than two hours. Part of the cargo was lifted eight at a time into the fuselage by an electric elevator. The entire shipment was delivered the same day after a non-stop flight from Cincinnati

Crisis in Selenium

NPA looks for a way to relieve shortage of metal which conducts electricity in one direction

A NEW allocating system for selenium is now in the works at NPA. The system will attempt to avert a shortage which is fast becoming critical.

As production of the rare metal falls further behind the 1 million pound estimate for 1951 and demand stands at 160 per cent of supply, the old directive method of allocating selenium is no longer workable.

Affected by Copper—Supplies undoubtedly will become more depleted as one prime producer has ceased making selenium and because of recent work stoppages in the copper industry. Selenium is a by-product of certain copper refining operations.

Selenium has the unique property of transmitting a current of electricity in one direction only. It is widely used in rectifiers by the electronics industry to convert alternating current to direct current. Rectifiers are an integral part of battery chargers, fire alarms, traffic controls, radio and television sets, radar units, and power equipment of all sorts.

The metal is also used in glass manufacture for such items as milk bottles, food containers, colored glass ware, table wares and railroad equipment. Selenium is used, too, in the production of stainless steel (one of the largest quantity uses), rubber, chemicals, and ceramics.

What Manufacturers Say—Manufacturers of table and crystal glassware say that any further limitations on the use of selenium would be injurious to their business, and in some cases might lead to shutdowns.

A representative group of manufacturers of selenium rectifiers told the NPA their stocks of selenium had declined to as low as a three-day supply and that there is a possibility that all DO rated orders will not be filled.

No Other Relief — Exploratory work is being conducted by the government to develop new sources of selenium and experimentation with manganese and other minerals in the making of glass has been tried. No immediate relief in the shortage has come forth from these efforts. A type of rare earth, cerium oxide, would be satisfactory for glass making but investigation has proved that there is not enough of it available to supply even one of the smaller glass plants for a year.

So far there is no acceptable substitute for selenium.



"BOGIE" MAN? Under this inspector are steel "bogie" wheels, used on all U.S. Army half-tracks. He looks them over before solid rubber tires are vulcanized to the rims by B. F. Goodrich Co. The wheels carry the weight of the vehicles, riding within rotating rubber band tracks that provide an endless rubber path on cross-country runs. Many thousands of "bogie" wheels are processed by the rubber company at its Los Angeles and other plants

Defense Pools Progress Report: Things Look Good

REVIVED less than six months also, defense production pools are still in various stages of development. They are patterned after those of World War II days.

Five have been approved so far by NPA's Pooling Section, Office of Small Business.

Approval is forthcoming on a sixth organization: Mil-Fin Inc., Waukegan, Ill. A seventh application is pending approval. Interest in production pools is high, says the Pooling Section; requests for its booklet "Pooling Production for Defense" (published in July) and other information are coming from all parts of the country. The agency is following progress of the new-born organizations closely to discover shorter paths through the maze of government requirements.

Status—Three pools are still in organizational stages of development; the others have already landed government work. One pool has over 100 members. All organizations are swelling in size and none has reported withdrawals.

Volume is still quite low; top pool still has less than \$2 million in defense orders. That's higher volume (and more contracts) than it had during the entire first year of operation during World War II. One pool reports "no orders as yet," but tells of

"important developments pending."

Modus Operandi—Products manufactured range from molded rubber products and packing boxes to aircraft components and electronic test sets. Parts of each new contract are distributed to member companies having open capacities and facilities to handle them. The pooling organization doesn't handle all defense contracts for all of its members—some bid directly on procurements if they can handle the job alone.

To line up defense work, pools use orthodox means: Brochures, written solicitations, personal contacts with procurement officers. Once the first few contracts are landed, the sailing becomes smoother—if the subcontract work is distributed equitably.

Advice—Getting off to a good start requires "the right spirit and lots of hard work as well as confidence of the membership," says one organization. Another recommends "patience and fortitude." The government scrutinizes applications from prospective pools carefully—to keep them within the anti-trust laws for one thing. Financing is another problem. Most pools depend on members (dues, initiation fees) for operating expenses. Commercial loans have been obtained by one pool; it is possible also to get V-loans from Federal Reserve banks

HOLES HOLES

and more **HOLES**
1500 of them

To be sure, this may be an unusual job. However, it proved the flexibility and practicality of the Bullard Spacer.

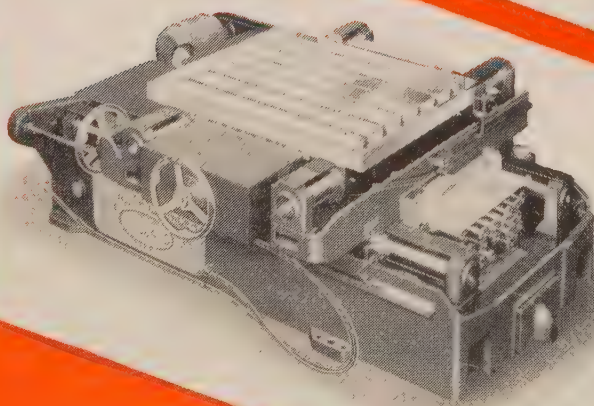
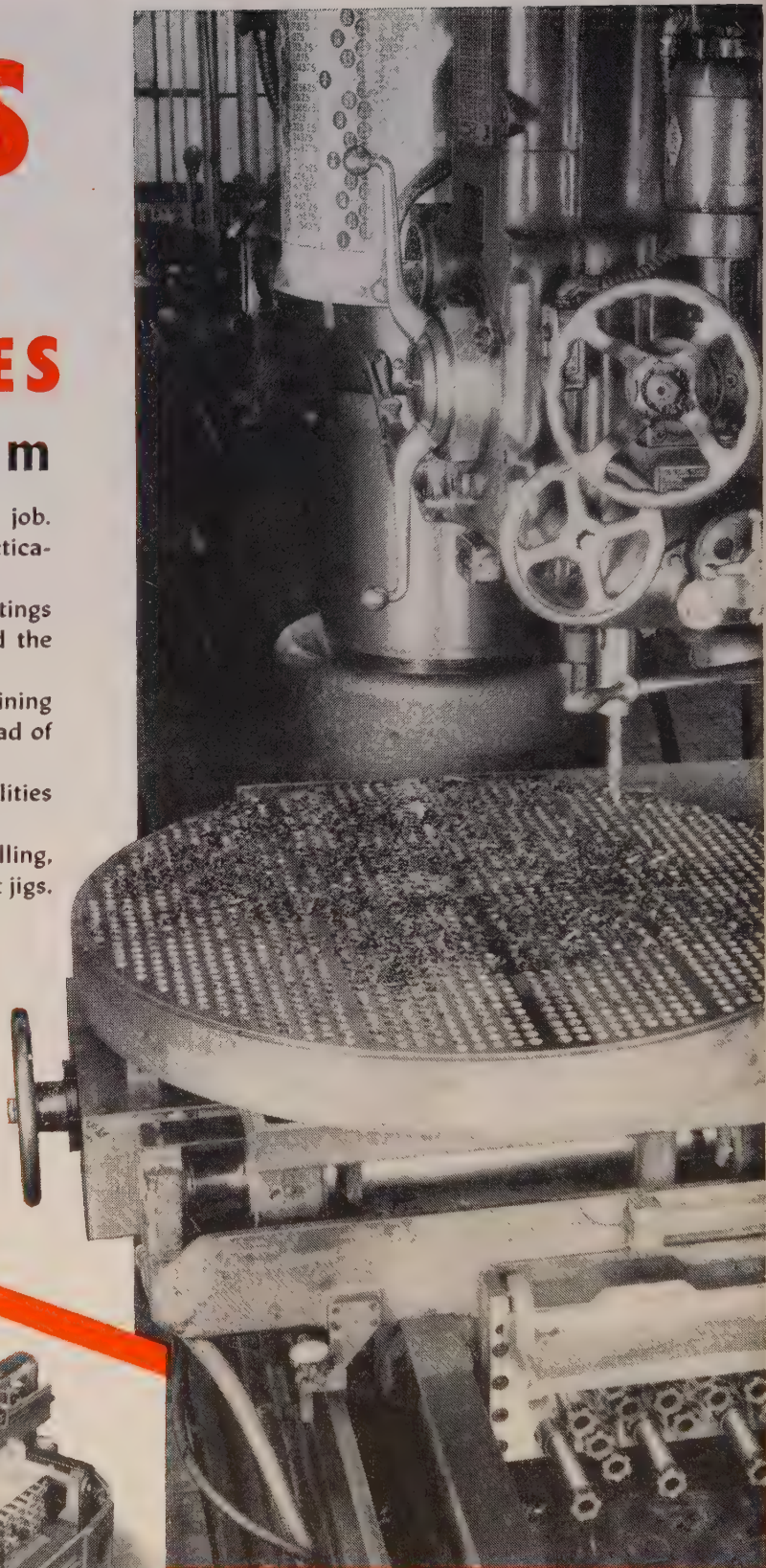
It required several combination of settings between the work location on the table and the drill saddle and arm.

However, the actual set-up and machining time figured 5-½ hours for the Spacer instead of 11-½ by the best previous method.

This case study illustrates the possibilities and wide application of the Bullard Spacer.

Here is a machine for spotting, drilling, counterboring, reaming, or tapping—without jigs.

*Ask Bullard Engineers
how your Jig Costs and
problems can be reduced.*



BULLARD 30 x 20 SPACER

THE
BULLARD
C O M P A N Y
BRIDGEPORT 2, CONN.

Mirrors of Motordom

Future demand for autos should be even greater than now, so auto makers are willingly financing expansion which for the time being will be used for defense

DETROIT IF AUTOMOBILE company analysts have figured correctly, demand for cars and trucks in future years will make 1950's production and sales totals look puny.

The industry's capacity last year was demonstrated to be in excess of ten million units. Production, of course, was not that great, but weekly output on several occasions was over 200,000. This meant that facilities were pushed to the limit, that overtime was the order of the day, that materials were scrounged, that other uneconomical practices were condoned.

Dual Purpose—Autodom is working hard now to make sure those expedients won't be necessary again. While there is acceptance by automakers of the fact that defense production may be necessary in some volume for a good many years, they are trying in most cases to build facilities adaptable to peacetime use. Automen will admit that some of the plants they are building with their own money now may turn out to be white elephants; that's a gamble they're willing to take. Wherever possible, however, they are giving the architects the tough job of designing structures which have usefulness in either real peace or real war. Nobody likes a "standby" plant when it's only standing by.

It's fortunate that so many of the military needs are not too greatly unlike civilian goods, if not in application or appearance at least in manufacturing methods. If this were not the case, a tremendously high percentage of the facilities now abuilding for military production would have to be financed by the public, and in all likelihood the civilian economy necessary to support a military program would be in dire distress.

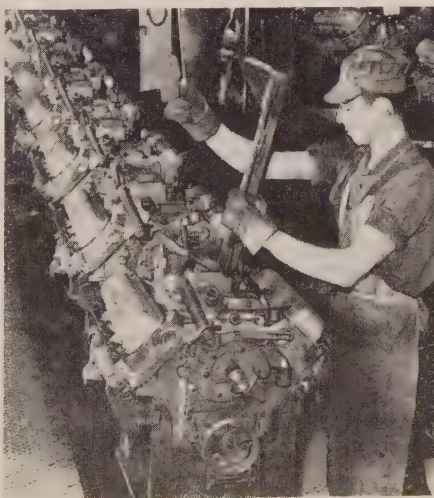
Shortsighted Fuss—A threat to the auto industry's expansion plans is the hullabaloo raised by organ-

ized labor when a program calls for construction of a new plant and transfer of some activities from one city to another. Walter Reuther is having a tough time keeping the UAW's quick-action boys from disrupting production on a wide front. Local 600 at Ford's Rouge was set to strike to keep part of the company's engine manufacture from being moved to Cleveland, even though the company and the union leaders were in basic agreement as to the move. In Flint where another strong anti-Reuther faction operates, the trouble-shooting UAW president a week ago Sunday told a union mass meeting that unemployment in auto plants will not last too long, and a labor shortage will develop in the area as soon as the General Motors' plants there are tooled for defense work. He described the action being taken by the union to lessen the impact of the change from civilian to military production, and pushed aside as unrealistic the suggestion made by some of the members that they

should have a 30-hour week with 40-hours pay.

He would undoubtedly have liked to be able to tell this group of a new facility for Flint, announced last Tuesday by Chevrolet. The million-square-foot plant will be devoted to production of Wright aircraft engines — the 2700-hp R-3350-26W and the 3500-hp R-3350-30W. It will consist of a main manufacturing building 900 by 1120 feet, to house machining and subassembly operations, an office building and a cafeteria with garage facilities underneath. It will adjoin the present Chevrolet-Flint assembly plant on the city limits. Ground will be broken as soon as construction contracts are completed. H. E. Beyster & Associates Inc., Detroit, is the architect and engineer. This is the second large-scale expansion which the Air Force-Navy Wright Engine contract has necessitated. Another million-square-foot plant at Buffalo is under construction.

Things To Come — What can be expected to happen when a new automotive facility gets into operation was described by Chrysler Vice President H. R. Matheny recently. His specific subject was



"COMBINED OPERATIONS": Oldsmobile-built rockets come down the conveyor lines in two assembly plants at Lansing, Mich. At left are Oldsmobile high compression "Rocket" engines being assembled in the Kettering Engine Plant, which is just celebrating its third anniversary. At right are 3.5-inch rockets for the Army's super bazooka coming down a conveyor line on their way to the infra red drying oven after painting. Rockets are only one phase of Olds' program of combined operations. Others are 90-millimeter tank guns and rotating parts for the J-65 Sapphire jet aircraft engine

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Chrysler's new engine plant, down river from Detroit, in Trenton, Mich. To contain 1,130,000 square feet, and employ about 6000 people, the operation was planned to take some of the load off the corporation's other engine-building facilities which have long been inadequate for the higher demand which the company feels is coming.

The observer can wonder why at this time additional engine-building capacity is necessary, and the company itself is not sure what use actually will be made of the plant. "We are proceeding on the assumption," says Mr. Matheny, "that we will be able to build engines at the Trenton plant, but we are ready to serve the national interest here if necessary." Although the south unit of the plant will probably be completed by the end of this month and the north unit of about the same size will be finished next year, part if not all of the facility may be devoted to some kind of defense work instead of passenger car and truck engines for which it is intended.

An operation of this size, irrespective of its use, is going to have a tremendous impact on the community. Mr. Matheny estimates that when the plant is in full swing, one out of every six of Trenton's industrial work-force will be a Chrysler employee. This is about the same ratio as in Detroit. Assuming that the average Chrysler worker in Trenton will have the same size family and spend his earnings in about the same pattern, he projects a \$15 million yearly increase in retail trade directly caused. It means that established retail firms will get a definite increase in trade, and in all likelihood new retail firms and services will be attracted. These in turn will generate more work and business in the area.

More Steel in Michigan?

In recognition of the ever-widening circles of influence which new plants have on a community, the Michigan Economic Development Commission last summer undertook to determine what the State has to offer manufacturers and also what it is lacking. This survey, made by the University of Michigan's Survey Research Center, dis-

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,682	897,853
Six Mos.	4,137,204	3,941,878
July	522,858	746,801
August	571,442	842,335
September	494,810*	760,847
October		796,010
November		833,784
December		671,622
Week Ended	1951	1950
Sept. 1	137,479	188,072
Sept. 8	103,224	151,606
Sept. 15	136,150	185,421
Sept. 22	135,015	188,451
Sept. 29	115,319	187,030
Oct. 6	123,000*	174,234

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

closed that among the state's most serious drawbacks was the lack of steel producing facilities. This was a majority opinion held among some 200 of the State's manufacturing companies, none of whom is an automaker. A committee was appointed within the commission to determine two points: Does the State need more steel capacity and what types of steel products are most needed, and can such capacity be installed and operated at a profit. Named to head the committee was William H. McGaughey, public relations director, Automobile Manufacturers Association.

The committee will investigate per-capita production and consumption of steel in the United States and in Michigan. It will seek figures as to the tonnage of various types of steel required in the State, and will try to make a sliding scale of requirements based on different levels of automobile production. It will attempt to determine the cost of new capacity, reaction of present steel producers and users to the idea of additional nearby sources of supply, and availability of materials and labor.

Auto Problems: Engineering

Looking ahead in a little different direction is Benson Ford, vice president of Ford Motor Co. and general manager of the Lincoln-Mercury Division. Frank to

admit that he is no engineer and that no group of specialists in the automotive industry—be they manufacturing, sales, purchasing, industrial relations, engineering or financial personnel—can function without the others, he told more than 1600 SAE members who were visiting the engineering staff operations of Ford at Dearborn that future problems of the industry will predominantly be in the engineering realm.

One of the most important problems will be with materials—especially metals, he said. Most engineers would agree, he asserted, that "we could use a new type of basic metal which is stronger, lighter and cheaper to produce than steel. Insofar as automobile manufacturing is concerned, the advantages of steel are offset by a great many disadvantages and, in time, those disadvantages could force us to find something better."

Aluminum is not necessarily what he was suggesting. "I've been told," he said, "that the use of aluminum is not entirely an answer because of cost of fabrication. But is that the extent of the possibilities?" He then asked: "And must we continue to rely on materials that are almost always scarce and likely to be scarce in the future? Have we done as much as we can with plastics or glass and other synthetics? What about the power plant—can we harness atomic power or solar energy for an automotive vehicle, or can diesel or jet propulsion be adopted? How about safety. Can automotive engineers go further, using radar or electronics to make cars immune to collisions?"

Fisher-Bullard Accord Reached

Agreement has been reached between Fisher Body Division of General Motors and Bullard Co., Bridgeport, Conn., over the body builder's participation in vertical turret lathe manufacture. Maximum production by Fisher of 50 cutmasters a month is called for, with its Pittsburgh plant to be used as the assembly point. Tool room facilities of seven Fisher Body plants in five cities—Pittsburgh, Cleveland, Hamilton, Flint and Detroit—will be used for parts and components fabrication.

The Business Trend

Difficulties encountered in shifting to a part defense and part peace economy cause industrial production index to slip moderately

INDUSTRY continues to adjust its gears to a part peace, part defense production. This adjustment, like many another, is not without its difficulties, its disappointments, and its dislocations. It's no little task to reach a new balance between the various segments of the economy.

So, we find production in some plants and some industries racing along at record speeds, while in others there's a lull. These contrasting conditions combined in such a manner as to depress STEEL's industrial production index in the week ended Sept. 29 to 212 per cent of the 1936-1939 average. In the preceding week the index registered 216 per cent.

This decline occurred while the steel industry's weekly outturn of steel for ingots and castings was the greatest since mid-August and while railroad carloadings and electricity output shot ahead at high levels. The sinker in the week's index was automobile production. It was the

lowest since the Labor Day holiday week.

More and More Steel . . .

A further rise in steel production was scheduled for the week ended Oct. 6, but labor difficulties in one company's plants threatened to prevent the increase. If schedules could be adhered to, the above-capacity production of the industry for that week would total 2,051,000 net tons, the American Iron & Steel Institute said. Output in the week ended Sept. 29 was 2,041,000 tons. Thanks to capacity expansion, production now is running around 100,000 tons a week above that of this time last year.

Side Street for Autos . . .

All consumption of steel is now under government restrictions, and numerous producers of civilian goods are not getting all of that metal they need. Yet steel continues to pour forth at a record-breaking pace. That

indicates a substantial portion of defense and defense-supporting work is well under way and swallowing up steel as fast as it can be produced. One of the industries having to step aside is the automobile makers. Although they report auto sales now are exceeding production they cut output in the week ended Sept. 29 to an estimated 115,319 passenger cars in the United States and Canada, says *Ward's Automotive Reports*. Reason: Materials shortages, attainment of NPA third-quarter production quotas, and taking of inventory.

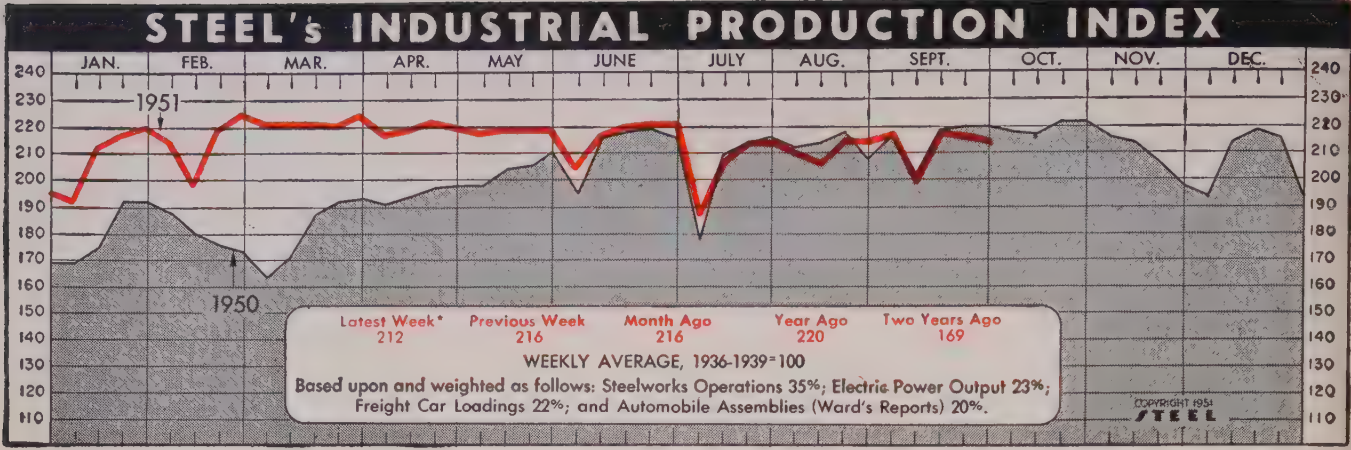
The first three quarters of this year yielded 5,396,000 vehicles from U. S. plants, compared with 6,015,000 in the like period of 1950.

Current Outlook . . .

Another indicator of progress in expanding industry and the economy to provide a good supply of guns and butter at the same time is electricity consumption. Increased industrial activity and a step-up in the use of electricity in the home and on the farm are keeping consumption of current 10 to 12 per cent above that of this time last year. And there is no visible end to the increase in de-

BAROMETERS of BUSINESS

	LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.5	101.0	100.0
	Electric Power Distributed (million kilowatt hours)	7,102	7,014	7,146
	Bituminous Coal Production (daily av.—1000 tons)	1,817	1,810	1,800
	Petroleum Production (daily av.—1000 bbl)	6,310	6,298	6,232
	Construction Volume (ENR—Unit \$1,000,000)	\$335.1	\$232.4	\$257.4
	Automobile and Truck Output (Ward's—number units)	115,319	135,015	137,479
* Dates on request. † Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	870†	864	829
	Business Failures (Dun & Bradstreet, number)	154	160	164
	Currency in Circulation (in millions of dollars)‡	\$28,137	\$28,140	\$28,034
	Department Store Sales (changes from like wk. a yr. ago)‡	—1%	—10%	—3%
† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	\$17,114	\$18,734	\$13,962
	Federal Gross Debt (billions)	\$257.1	\$256.8	\$256.6
	Bond Volume, NYSE (millions)	\$13.2	\$14.2	\$10.9
	Stocks Sales, NYSE (thousands of shares)	7,834	10,180	7,357
	Loans and Investments (billions)†	\$71.6	\$70.7	\$70.3
	United States Gov't. Obligations Held (millions)†	\$31,333	\$30,722	\$30,983
† Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92
	STEEL's Nonferrous Metal Price Index†	224.6	224.6	224.6
	All Commodities†	177.1	176.4	176.8
	Metals and Metal Products†	190.5	189.4	188.2
† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100. †† 1935-1939=100.				



mand for electrical energy, said A. A. Johnson, manager of Central Station Engineering for Westinghouse Electric Corp.

"Whether we have peace or war the electrical industry will continue to provide the power to turn the wheels of our great industrial nation," he pointed out. The electrical industry now backs up the average American industrial worker with from 7 to 8 horsepower of equipment to carry on his daily work, in effect giving each worker the equivalent of 350 men working for him, Mr. Johnson explained. And this figure will increase, he added.

From 1920 to 1951 installed gen-

erating capacity increased from about 13 million kilowatts to 75 million kilowatts. In the same time, generated kilowatt-hours increased from 40 billion to 360 billion. By 1961, it is expected that the installed generating capacity will reach 140 million kilowatts and the annual rate of generation over 600 billion kilowatt-hours, Mr. Johnson said.

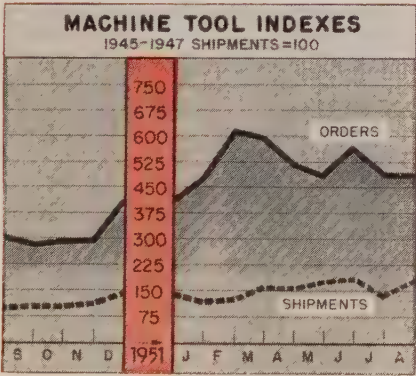
More Wash-Day Helpers...

While metals shortages are handicapping some companies so severely they are laying off employees, others are finding the sailing smoother. The home laundry equipment in-

dustry, for instance, boosted its output of household washers, automatic dryers and ironers in August over that of July. Factory sales of standard-size household washers in August totaled 239,081 units, a 71 per cent advance over the 139,799 of July. Factory sales of automatic dryers in August were up 53 per cent over July, totaling 40,191 units compared with 26,268 in August. Sales of ironers totaled 17,200 units, up 55 per cent over July's 11,000.

More Radios, Fewer TVs...

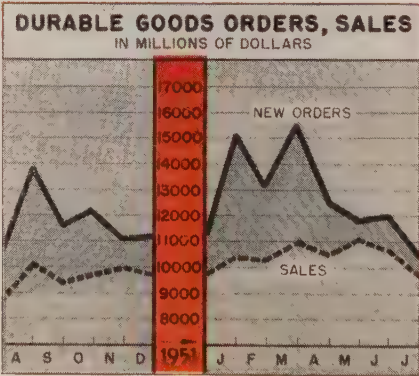
Also up in August was radio production; television output, however,



Machine Tool Indexes

	New Orders		Shipments	
	1951	1950	1951	1950
Jan.	475.4	99.7	114.3	52.8
Feb.	615.5	89.2	123.8	56.1
Mar.	590.3	107.4	158.9	75.3
Apr.	516.1	98.9	157.7	61.6
May	483.0	116.4	175.1	82.5
June	558.8	124.1	182.8	91.9
July	490.6	253.1	144.7	68.3
Aug.	488.3	305.1	177.3	95.7
Sept. ....	...	280.6	...	101.6
Oct. ....	...	289.6	...	100.9
Nov. ....	...	291.9	...	110.9
Dec. ....	...	410.1	...	135.7

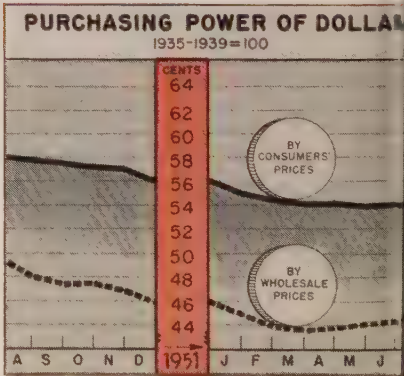
National Machine Tool Builders' Assn.



Durable Goods Orders, Sales
In Millions of Dollars

	New Orders		Sales*	
	1951	1950	1951	1950
Jan.	15,123	7,479	10,398	6,817
Feb.	13,153	7,213	10,338	7,103
Mar.	15,478	8,508	10,993	7,643
Apr.	12,614	7,857	10,532	7,488
May	11,773	8,514	11,077	8,605
June	12,018	9,814	10,660	9,030
July	10,413	10,553	9,748	8,670
Aug. ....	...	13,863	...	10,060
Sept. ....	...	11,500	...	9,392
Oct. ....	...	12,171	...	9,671
Nov. ....	...	10,621	...	9,730
Dec. ....	...	11,379	...	9,791

*Seasonally adjusted, U. S. Office of Business Economics.



Purchasing Power of the Dollar
Cents, as measured by:

	Wholesale Prices		Consumers' Prices	
	1951	1950	1951	1950
Jan.	44.6	53.1	55.1	59.5
Feb.	43.8	52.7	54.4	59.6
Mar.	43.7	52.7	54.2	59.4
Apr.	43.8	52.6	54.2	59.3
May	44.0	51.6	53.9	59.1
June	44.2	51.2	54.0	58.8
July	44.8	49.4	53.9	58.1
Aug. ....	...	48.3	...	57.7
Sept. ....	...	47.5	...	57.3
Oct. ....	...	47.5	...	56.9
Nov. ....	...	46.8	...	56.7
Dec. ....	...	45.8	...	55.9

U. S. Office of Business Economics

Charts—Copyright 1951, STEEL

was down. Radio production in August was 563,407 sets, compared with 548,495 in July, the Rad.o-Television Manufacturers Association reports. Television output in August was 146,705 sets, compared with 152,306 in July.

Production of radio and television receivers in the first eight months of 1951 decreased 3.5 per cent and 13 per cent, respectively, under the output in the corresponding period of 1950. Radio receiver production in the first eight months of 1951 amounted to 8,977,232 units, compared with 9,303,000 sets in the like period of last year.

Boom for Structurals ...

Reflecting the big expansion in the nation's industrial plant, August shipments of fabricated structural steel totaled 240,072 tons, the American Institute of Steel Construction reports. This is only slightly less than the June record of 257,066 tons which represented the largest month since 1930.

Backlog of orders for fabricated steel totaled 2,748,315 tons, compared

with 1,626,372 tons at the corresponding time last year.

Trends Fore and Aft ...

Third quarter industrial building costs, as reflected by the Austin Co.'s index, remained unchanged for the second successive quarter at 182 per cent of the 1926 average . . . The government's wholesale price index in the week ended Sept. 25 rose to the highest level since mid-August, 177.1 per cent of the 1926 average . . . New orders for industrial furnaces tapered off in August, totaling \$4,850,393 for fuel fired (except for hot-rolling steel) and \$3,891,339 for electric furnaces . . . New strikes in August totaled 425, the same number as in July. Number of employees involved in new stoppages in August also remained at the July level, 250,000. Man-days idle increased, however, from 1,750,000 in July to 2,750,000 in August, the highest idleness recorded in any month in 1951 . . . Foremen's earnings have risen 11.6 per cent since 1949, a survey by the Associated Industries of Cleveland reveals.

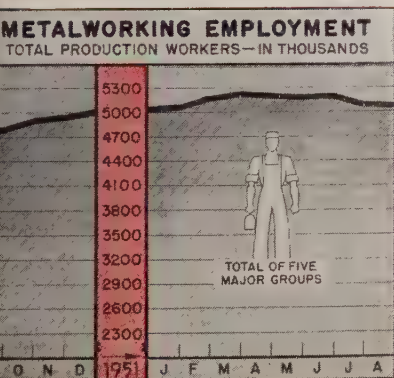
how to get an answer on spring steel requirements



Quick answers on "in stock" availabilities of spring steel (annealed or tempered) are assured at Kenilworth. At this pictured pentagon desk current inventory records make possible immediate response to your inquiries, by phone, wire or letter. Kenilworth's specialized spring steel department is well stocked with a wide variety of types, sizes and finishes — ready to meet your exacting specifications in shipment after shipment regardless of size of order. Try us today.

Issue Dates of other **FACTS** and **FIGURES** Published by **STEEL**:

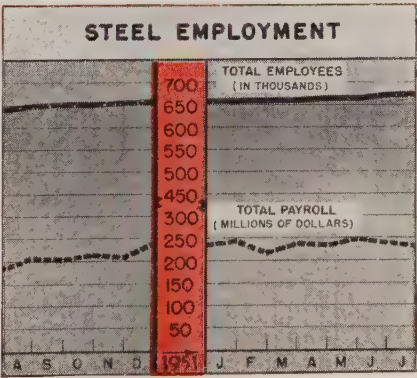
Durable GoodsAug.6	Indus. Production.Oct.1	RefrigeratorsOct.1
Fab. Struc. Steel.Sept.10	IronersSept.17	Steel CastingsSept.10
Foundry Equip.Sept.24	Malleable Castings.Sept.10	Steel ForgingsAug.20
Freight CarsSept.24	PricesOct.1	Steel Shipments.Aug.27
Furnaces, Indus.Sept.17	Pumps, New Orders.July9	Vacuum Cleaners.Oct.1
Furnaces, W. Air.Sept.17	Radio, TVAug.20	Wages, Metalwkg.Aug.13
Gear SalesSept.17	Ranges, Elec.Sept.24	WashersSept.17
Gray Iron Castings.Sept.10	Ranges, GasSept.24	Water HeatersOct.1



Metalworking Employment
Production Workers—Five Major Groups

	Prim. Mtls.	Fab. Prod.	Mach- Inery	Elec. Mch.	Trans. Equip.
1950					
Aug. 1,086	814	1,060	655	1,118	
Sept. 1,105	837	1,050	673	1,134	
Oct. 1,117	850	1,104	710	1,157	
Nov. 1,125	849	1,133	720	1,128	
Dec. 1,142	852	1,163	724	1,160	
1951					
Jan. 1,149	847	1,192	711	1,175	
Feb. 1,153	853	1,219	716	1,228	
Mar. 1,158	858	1,228	724	1,259	
Apr. 1,159	858	1,234	717	1,244	
May 1,161	850	1,246	709	1,231	
June 1,171	843	1,253	703	1,235	
July 1,154	814	1,233	699	1,203	
Aug. 1,165	810	1,214	696	1,204	

U. S. Bureau of Labor Statistics



Steel Employment, Payrolls

	Employees† in Thousands		Payrolls in Millions	
	1951	1950	1951	1950
Jan.	657	609	\$245.3	\$189.3
Feb.	663	613	219.4	174.7
Mar.	663	616	238.3	190.0
Apr.	666	621	234.8	186.2
May	667	628	249.0	199.9
June	674	636	240.7	195.3
July	678	643	231.9	188.7
Aug.	649	649	206.6	206.6
Sept.	650	650	203.8	203.8
Oct.	650	650	212.2	212.2
Nov.	653	653	208.0	208.0
Dec.	657	657	235.0	235.0

† Monthly average. American Iron & Steel Institute.

THE
Kenilworth Steel Co.
750 BOULEVARD
KENILWORTH, N. J.
SPECIALISTS IN FLAT ROLLED METAL PRODUCTS
Telephones: N. Y. COrtlandt 7-2427
N. J. UNionville 2-6900
Teletype: Roselle, N. J., 387



SPEED NUTS score

"direct hit"

on Globe Jet Target

How SPEED NUTS "shot down" cost of assembly, saved time and ended vibration-loosening problems on Globe Jet Powered aircraft targets.

Speeds attained by the Globe KD2G-2 jet target are high enough to provide the realistic touch of actual air-to-air or air-to-ship attacks. This sleek craft is the result of over three years of development work by Globe Corporation, Aircraft Division, Joliet, Illinois, in cooperation with the Navy Department, Bureau of Aeronautics.

Globe engineers had to plan assembly of the target with fasteners that could take intense vibration. Of

all those tested, Tinnerman SPEED NUTS made the biggest hit. *Not only did SPEED NUTS end vibration loosening problems, they also provided an average time-savings of 48% per application over other methods.*

Globe is justifiably proud of the jet target, one of the achievements that stands out in its 50th anniversary year. And Tinnerman is proud of its part in this success. Perhaps your company can use the valuable experience gained by Tinnerman on this and many other projects. Write for information on our comprehensive Fastening Analysis Service. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Limited, Hamilton. In Great Britain: Simmonds Aerocessories, Limited, Treforest, Wales.

SPEED CLAMPS attach hose to fitting of internal fuel line. Note low profile of one-piece clamp.

Tail cone is attached with 5"U"-type SPEED NUTS which hold themselves in bolt-receiving position for blind assembly.

More than 23 SPEED NUTS are used in various locations on the KD2G-2 target. They must hold tight under vibrations created by the jet engine pulsating at 70 to 80 cycles per second, catapult shocks of 10 to 15 g's acceleration, and the impact of parachute landings at end of each mission.

"AN" receptacles on junction box are secured by SPEED NUT retainer rings.

TINNERMAN ***Speed Nuts***[®]

*Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS[®]

Men of Industry



F. I. GOODRICH

... gen. mgr., Eaton Spring Div.



ROBERT BARIT

... Hudson Motor Car V. P.-purchasing



L. K. STRINGHAM

... Lincoln Electric chief engineer

Eaton Mfg. Co. announces these promotions at its Spring Division in Detroit: **F. I. Goodrich** succeeds the late **W. H. Wallace** as general manager; **E. H. Lindeman** becomes assistant general manager in charge of leaf springs, and **H. H. Clark** will be assistant general manager in charge of coil springs.

James H. Ingersoll was elected vice president of **Ingersoll Products Division**, Borg-Warner Corp., Chicago. He previously was assistant to the president of the division, and has served since 1945 in various capacities at the Ingersoll plant in Chicago.

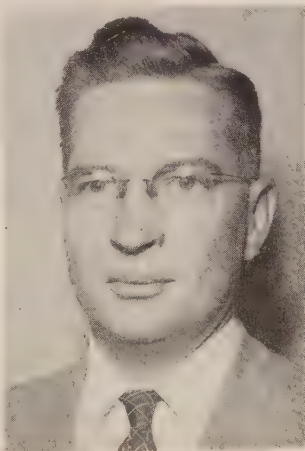
H. V. Rasmussen was appointed executive engineer at the Wellsville, N. Y., plant of **Worthington Pump & Machinery Corp.** He spent a number of years with both Westinghouse Electric Corp. and De Laval Steam Turbine Co. During World War II he was a consultant for National Defense Research at Columbia University, and a representative on both the Navy-Industry Committee on propulsion turbines and the advisory committee of International Electro-Technical Commission.

Elmer E. Hightower has joined the Detroit sales staff of **Lapeer Mfg. Co.**

Carl A. Ten Hoopen Sr. was appointed Pacific Coast sales manager of the Cyclone Fence Division of **American Steel & Wire Co.** He was assistant general sales manager of the division. **Raymond G. Russell**, Pacific Coast vice president of Cyclone Fence, Oakland, Calif., has retired after more than 40 years' service with the wire company.

Robert Barit was elected vice president in charge of purchasing for **Hudson Motor Car Co.**, Detroit. He succeeds **G. W. Munger**, retired after more than 32 years of service. Mr. Barit has been in charge of the purchasing department under Mr. Munger's direction for several years with the title of purchasing agent.

Dr. Charles H. Moore was appointed head of the metal and ceramic division of **P. R. Mallory & Co. Inc.**, Indianapolis. Prior to Sept. 15 when he joined Mallory, he was technical director of National Lead Co. of Ohio. Dr. Moore invented and developed Rutile gems, often referred to as Titania, and has had extensive experience with titanium in addition to his work with the gems which are made from titanium dioxide. Previous to his years with National Lead he was visiting professor at Rutgers University, conducting courses in crystal chemistry of ceramic materials.



DR. CHARLES H. MOORE

... heads a div. at P. R. Mallory

L. K. Stringham was appointed chief engineer for **Lincoln Electric Co.**, Cleveland. **G. G. Landis** continues as engineering vice president. Mr. Stringham has been with Lincoln since 1933. For the last two years he has been director of welding development.

Joel Hunter Jr. was appointed vice president in charge of finance of **Crucible Steel Co. of America**, New York.

Whirlpool Corp., St. Joseph, Mich., elected **Kenneth MacGrath** general vice president, a new position, and **Donald W. Alexander** vice president in charge of production. Mr. MacGrath was manufacturing vice president, and Mr. Alexander was formerly vice president of P. R. Mallory & Co. Inc.

W. M. Pearce was named manager of **Kaiser-Frazer Corp.**'s new stamping division now nearing completion at Shadyside, O. He was manager of the K-F car assembly plant at Portland, Oreg., and has been associated with various Kaiser interests for the last 13 years.

Robert C. Becherer was elected executive vice president of **Link-Belt Co.**, Chicago. He was elected vice president last March and since 1947 has been general manager of the company's Ewart plant in Indianapolis. **Richard E. Whinrey**, assistant general manager of the Ewart plant, succeeds Mr. Becherer as general manager.

Dale C. Hergert was named acting purchasing agent for the Nashville,

Tenn., plant of the Crosley Division of Avco Mfg. Corp. and assumes his new duties Oct. 15. He succeeds **A. A. Price**.

Charles H. Cecil was appointed vice president of **Northwestern Steel & Wire Co.**, Sterling, Ill. He formerly was with Bethlehem Steel Co., serving first in the operating department and later in the sales department.

Anthony G. Ruediger was appointed director of procurement for **Carrier Corp.**, Syracuse, N. Y. He takes over post vacated by **Ralph H. Anderson** who was granted a leave of absence to fill a government position.

M. W. Barlow resigned as sales manager of **British Electro Metallurgical Co. Ltd.**, Sheffield, England, to join **Foundry Services Ltd.**, Birmingham, England. He will be responsible for both manufacture and sales of Foseco ferroalloy products.

Menasco Mfg. Co., Burbank, Calif., elected as directors **Robert D. Cavanaugh** and **Franklin C. Wolfe**.

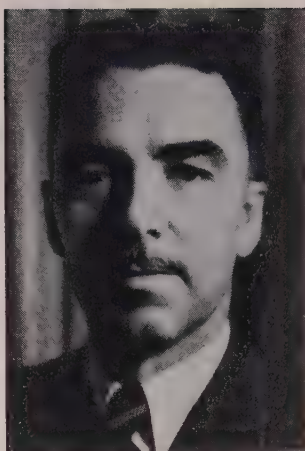
Horace W. Potter, senior technical assistant of the open-hearth department of **Lukens Steel Co.**, Coatesville, Pa., was promoted to assistant to the open-hearth superintendent.

John C. Barnes, formerly vice president for sales, **National Radiator Co.**, purchased the capital stock of **Atlantic Steel Boiler Co.**, Philadelphia, and will be president of the organization which will operate under the name of **Atlantic Steel Boiler Co. Inc.** **W. A. Bartley**, who founded the company in 1939, announces plans for permanent retirement from the heating industry. The personnel and facilities of the original company are being retained.



JOHN C. BARNES

... purchases Atlantic Steel Boiler



W. C. LANDIS

... gen. mgr., Air Brake Division

Westinghouse Air Brake Co., Wilmerding, Pa., appointed **W. C. Landis** general manager of its Air Brake Division, and **A. M. Wiggins**, general manager of its Union Switch & Signal Division. Both men are vice presidents. Mr. Landis will be responsible for operations and earnings of Air Brake, which operates plants at Wilmerding and Emeryville, Calif. Mr. Wiggins will have similar responsibilities for the Swissvale, Pa., operations. These two divisions were created last July following merger of **Westinghouse Air Brake Co.**, **Union Switch & Signal Co.** and **Westinghouse Pacific Coast Brake Co.**

Janette Mfg. Co., Chicago, appointed **O. J. Maag** sales manager, and **F. C. Hartmann**, assistant sales manager.

Howe Scale Co., Rutland, Vt., appointed **Lierd E. Grant** manager of the Los Angeles branch. He will continue as manager of the San Francisco branch where **William J. Tukey** was appointed assistant branch manager. **O. B. Collins** becomes manager of the Atlanta branch, and **Jack H. Brewer**, manager of the Minneapolis branch.

Reliance Electric & Engineering Co., Cleveland, appointed four buyers to its purchasing department. They are: **Nolan B. Barnard**, **James H. Himes**, **Morley Hitchcock**, and **William F. Simmonds**.

Phillip K. Coe, account executive in the **Goodyear Tire & Rubber Co.**'s Detroit manufacturers sales office, was appointed assistant to the vice president.

Hickman, Williams & Co., Chicago, elected **Norman E. Craig** and **John H. Tressler** to its board of directors. Mr. Craig is resident manager of the



A. M. WIGGINS

... gen. mgr., Union Switch & Signal

New York office, and Mr. Tressler, resident manager, Cleveland office.

J. H. Rasmussen was appointed vice president in charge of sales of cooking and heating appliances at **Perfection Stove Co.**, Cleveland.

Robert S. Strawsburg was appointed district manager of the Buffalo office of **Warner & Swasey Co.** He has been European resident field engineer for the company with headquarters in Paris since 1948, and returned in January to the company's East Orange, N. J., office.

James H. Wolcott was appointed sales manager, machinery division, **Reed-Prentice Corp.**, Worcester, Mass. He transfers from Chicago Oct. 15, where, since 1950, he has been branch sales office manager.

Olavi J. Warpula was appointed resident demonstrator for the grinding machine division of **Norton Co.**, Worcester, Mass. He will be assigned to the Detroit office replacing **George B. Taft**, retired.

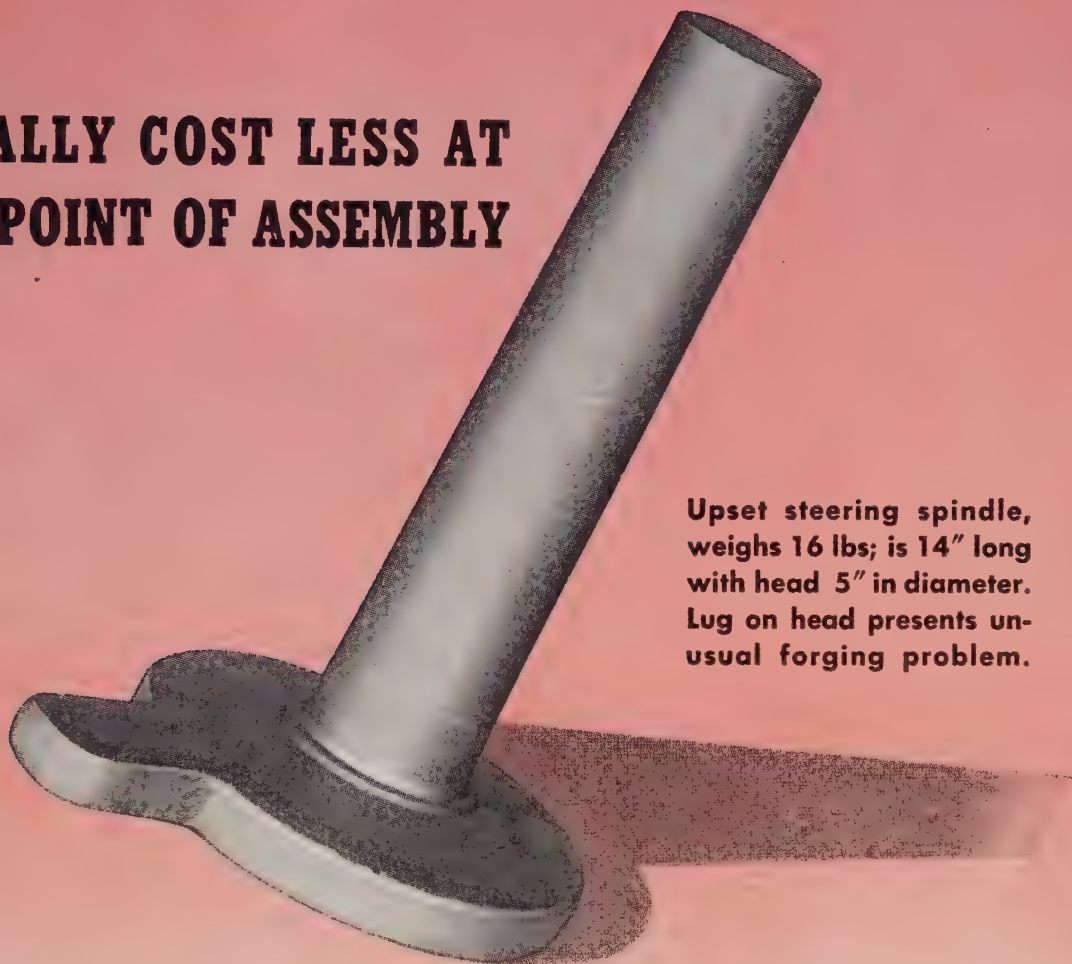
Harris C. Miller was assigned to sales territory comprising upper New York state and western Pennsylvania by **Hooker Electrochemical Co.** Headquarters will be at Niagara Falls, N. Y.

E. J. Campbell was appointed mid-western district sales manager, **Wolverine Tube Division**, Calumet & Hecla Consolidated Copper Co. He continues headquarters at Chicago.

Woodhouse Chain Works, Trenton, N. J., one of the Round Chain Companies, appointed **Otto F. Bender** district sales manager, Philadelphia area. He spent the last three years representing Crane & Hoist Division,

TRANSUE FORGINGS

**USUALLY COST LESS AT
THE POINT OF ASSEMBLY**



Upset steering spindle,
weighs 16 lbs; is 14" long
with head 5" in diameter.
Lug on head presents un-
usual forging problem.

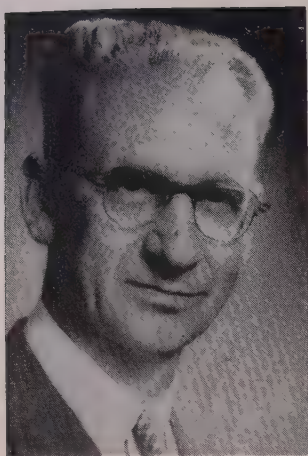
Consult our engineers when you
are contemplating conversion to
forgings or when you are in need
of reliable forging service.

TRANSUE & WILLIAMS

STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE



JOHAN A. MULLER

... joins Lewis Welding & Engineering



JAY S. HUDSON

... asst. to exec. V. P. at Willard



A. E. WEROLIN

... V. P. of National Motor Bearing

Manning, Maxwell & Moore, as a field engineer in that region.

Johan A. Muller joined **Lewis Welding & Engineering Corp.**, Bedford, O., as head of a newly formed development department. Mr. Muller, who holds many U. S. patents covering various phases of his work, has specialized in design and development of hydraulic equipment, particularly in its application to plastics and rubber manufacturing industry.

Wm. K. Stamets Co., Pittsburgh, appointed **A. L. Lentz** as sales manager. He was formerly Pittsburgh representative of Cincinnati Milling Machine Co.

John C. Ewer was appointed managing director of **Norton Grinding Wheel Co. Ltd.**, Welwyn Garden City, Herts, England. He has served as assistant general manager of the English plant since 1950.

Jay S. Hudson was appointed assistant to the executive vice president of **Willard Storage Battery Co.**, Cleveland. Formerly in the Willard legal department, Mr. Hudson joined the company in 1939 and has served for several years as legal adviser for labor relations and federal laws and regulations.

Raymond E. Zimmerman, since 1950 chief coal preparation engineer for **Koppers Co.**, was appointed chief preparation engineer in the coal division of **U. S. Steel Co.**, Pittsburgh.

Robert P. Bremner was named assistant to the vice president-operations, **Youngstown Sheet & Tube Co.**, Youngstown.

Plasteel Products Corp. appointed **John H. Wallace Jr.** sales representative for the Pittsburgh area, with headquarters at 1411 Berger Bldg., Pittsburgh.

A. E. Werolin, formerly managing partner of **McKinsey & Co.**, management consultant, was elected vice president of **National Motor Bearing Co. Inc.**, Redwood City, Calif. He will be in charge of administration and planning.

Harold H. Jeske was appointed director of manufacturing for **Gruen Watch Co.**, Cincinnati. All manufacturing operations in both the watch and defense divisions will be under his direction. Prior to his connection with Gruen, Mr. Jeske was vice president and general manager of **O. D. Jennings Co.**, and previously spent 12 years with **Hotpoint Inc.**

William G. Polley was appointed district sales manager at Atlanta for **Acme Steel Co.**, Chicago, to succeed the late **Clarence A. Carrell**. He is replaced as southern area special representative by **Charles R. Lammers**, who transfers from Buffalo.

OBITUARIES...

George Mace, 44, advertising manager of **Unit Crane & Shovel Corp.**, Milwaukee, died Sept. 27 following a heart attack.

Donald P. McCredie, 63, chief engineer for the Fleetwood plant of **Fisher Body Division**, General Motors Corp., Detroit, died Sept. 28. He was employed by GM for 33 years.

William S. Hammond, 75, president of **Consolidated Car Heating Co.**, Albany, N. Y., died Sept. 24.

Charles J. Reynolds, 60, mill representative for **Inland Steel Co.**, Chicago, died Sept. 27. He had been with the company since 1945.

Kenneth R. Douglas, who retired in

August as vice president of **Acme Metal Products Corp.**, Chicago, died Sept. 26.

Victor A. Ryan, director of research, **Crown Cork & Seal Co.**, Baltimore, died Sept. 20.

Edward J. Mershon, an associate of **Pittsburgh-Des Moines Steel Co.**, Pittsburgh, since 1916, died Sept. 25. He specialized in elevated steel tanks and steel grandstands.

Arthur E. Beecraft, associated for 40 years with **Drummond, McCall & Co.**, Toronto, Ont., iron and steel products, and lately an executive of the company, died Sept. 24.

George G. Mize, 56, chief engineer, **Diamond Chain Co. Inc.**, Indianapolis, died Sept. 4. He had been associated with the company since 1919 and chief

engineer since 1922. An authority on roller chain, he had for the last five years been engaged by **Armour Research Foundation**, Chicago, as a consultant on research in fatigue and wear of metals and mechanical development in particular.

W. Alfred Robinson, 42, personnel and safety director, **Morrison Steel Products Inc.**, Buffalo, died Sept. 22.

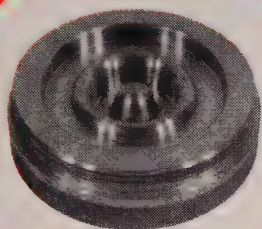
Charles F. Weber, 69, who retired in January as a vice president and treasurer of **Allied Chemical & Dye Corp.**, New York, died Sept. 29 in Elmsford, N. Y.

John C. Huffman, 48, district and regional manager for **Braeburn Alloy Steel Co.** at Cleveland, died Sept. 30 as a result of injuries received in an automobile accident.

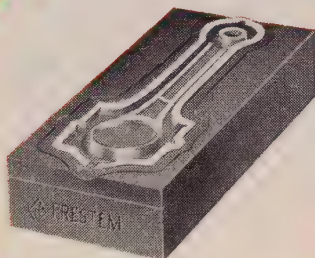
Presenting: A NEW HOT WORKING DIE STEEL
FOR PRESSES AND UPSETTERS—

PRESTEM

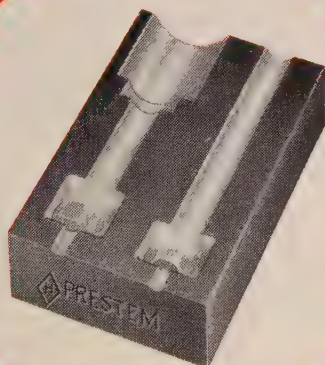
... ANOTHER **Heppenstall** "FIRST"!



PRESS DIE INSERT



PRESS DIE



UPSETTER DIE

The makers of Hardtem—first prehardened die block for drop hammer forgings—now introduce "*Prestem*", a new steel analysis developed especially for the hot working of steels in forging presses and upsetters.

Prestem is available in the form of blocks and bars for solid press dies, insert dies, upsetter dies, and punches. It machines readily at high hardness . . . has high impact resistance . . . can be water cooled during forging operations.

Results obtained the past year by three large automotive forge shops indicate that *Prestem* dies withstand abrasion and wear at high temperatures . . . resist heat checking during long runs . . . continually produce better quality forgings.

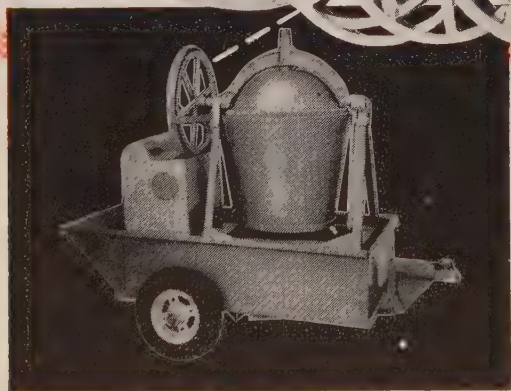
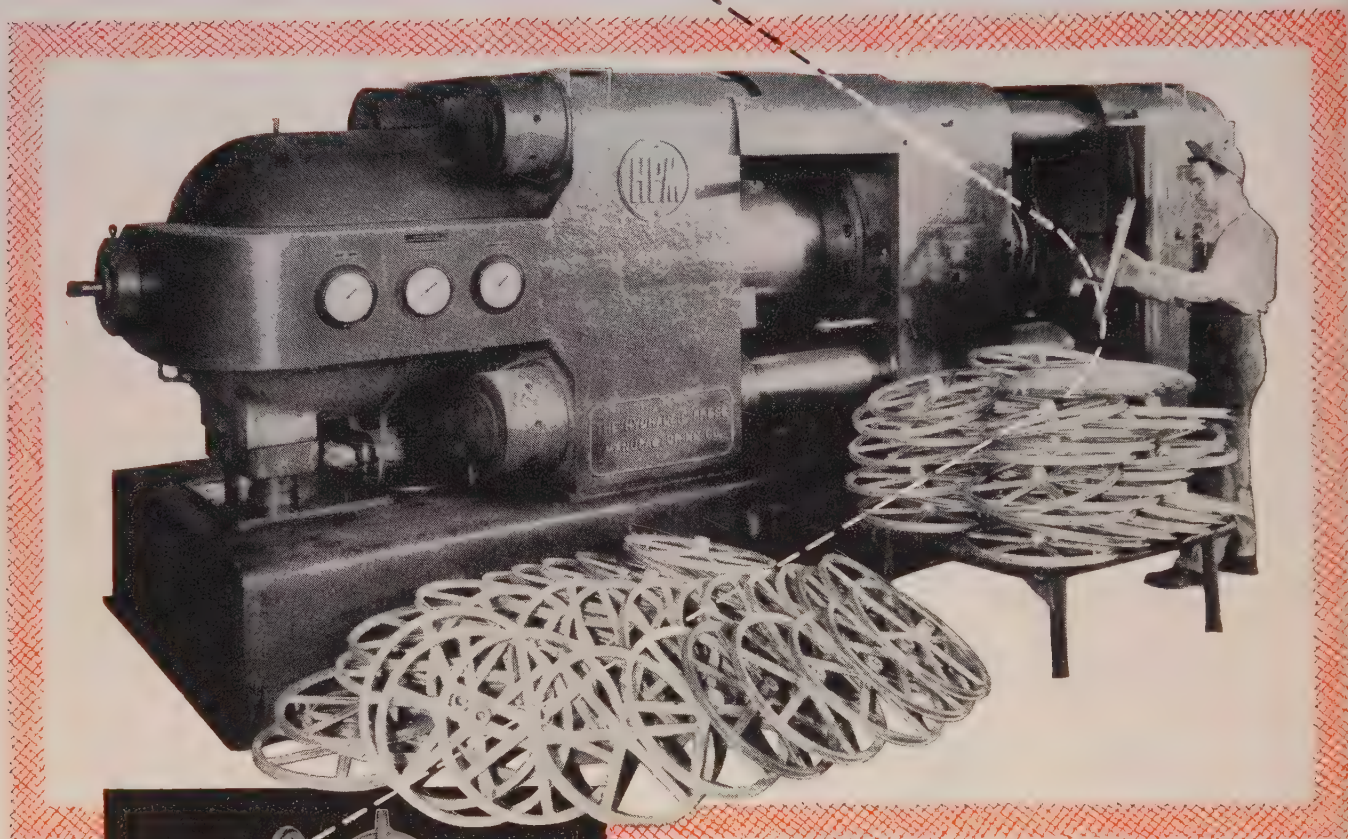
SEE AND HEAR
... the *Prestem* Story at the
National Metal Exposition
October 15 to 19
Detroit, Michigan
You are cordially invited
to the Heppenstall Exhibit
No. C-122 Bldg. C.

Heppenstall
PITTSBURGH 1, PENNA.

—the most dependable name in die blocks



CUT PARTS COSTS WITH H-P-M DIE-CASTING MACHINES...



If you haven't considered die cast parts, now is the time to investigate the process that has reduced costs and "upped" product quality for scores of manufacturers. As for the equipment, H-P-M Die Casting Machines have long been leaders in the field. There's a complete range of models (4 lbs. — 20 lbs. shots) for aluminum, zinc, brass and magnesium castings designed with proven H-P-M features for profitable operation. Call in your H-P-M engineer today for full particulars.

● Illustrated above is the die cast pulley wheel employed by Wright Engineering and Supply Company of Denver for a light weight portable mixer. Increased production and improved product quality has been Wright's experience since they installed this large H-P-M Die Casting Machine . . . and reaped the benefits that such H-P-M users as Hoover, General Electric, Westinghouse, Chrysler and many others enjoy.



THE HYDRAULIC PRESS MFG. CO.

1044 MARION ROAD - MOUNT GILEAD, OHIO, U.S.A.

Makers of Presses for the Metal Working and Processing Industries - Plastics Molding Presses - Die Casting Machines
Hydraulic Pumps, Valves and Power Units.

SERVING INDUSTRY THROUGH HYDRAULICS

WORLD CONGRESS OF IDEAS—For the first time in history an American technical society has gone all-out to assemble a representative worldwide group of engineers, metallurgists and technical experts in the metalworking field, with the idea of promoting an interchange of ideas on metals conservation and utilization in the light of today's conditions. It is perhaps entirely appropriate that Detroit should be the scene of the World Metallurgical Congress, with the kickoff scheduled Saturday.

Both ferrous and nonferrous plants, producing and fabricating, throughout the free nations of the world are wrestling with problems similar to those in the U.S.: Shortage of metallics, insufficiency of skilled technicians and capable management, and demand for finished goods outrunning supply.

Foreign conferees to the WMC, carefully chosen by their respective governments, with the aid of technical associations and institutes, have been touring U.S. industry since Sept. 13, seeing at first-hand the mass production techniques they have heard so much about. Strangely enough many of them, crammed full of the wonders of industrial America, at the tour's end expressed a desire to get some intimate glimpses of family life in this country; probably wondering whether mass production extended to the hearthside.

A complete roundup of the forthcoming congress and exposition, with its multitude of technical sessions, educational courses, seminars and roundtables reinforced by 6½ acres of wares displayed by 400 exhibitors, will convince anyone that this will be the "bestest and the mostest" of the metal shows ever unfolded. —pp. 116-132

STAINLESS SPRINGS FOR 'CHUTES—Type 302 stainless steel spring wire has replaced rubber on parachute straps being supplied the Air Force. Rubber was found to lose elasticity in extremes of temperature and humidity, factors of course having no effect on stainless steel springs. There are five springs in the strap, covered with fabric padding.

PLASTICS FOR A SOFT RIDE—Draw your own conclusions: The Erie railroad is starting tests in one of its freight yards with rails laid on tieplates of molded plastic having a laminated fiberglass base. Supplier of the plastic "believes" the plates will outlast the conventional steel types. They weigh one-fifth as much, are unaffected by corrosive media. How about cracking under extremes of temperature? or creep under heavy loads?

NITROGEN PROVIDER—Calcium cyanamid is a not too widely known although nonetheless potent "flavoring" material in steel. Its principal function is to increase nitrogen content and thereby promote aging or precipitation hardening, stimulate grain sensitivity and increase hardness and tensile strength.

It is used in both alloy and carbon steel heats as a ladle or runner addition, in open-hearth and electric furnaces. Tin plate producers are the largest users, the cyanamid increasing temper hardness with a minimum of cold rolling. It will also reduce sulphur and oxygen content of certain grades of steel. —p. 138

WORKS UNDER WATER—A new submersible type water pump is in production at an Arkansas plant. Pump and motor operate completely submerged in water and are both cooled and lubricated by the water. The pump is self-priming, requires no jets, rods or shafts and is claimed to be free from motor noises and vibration.

KEEP COOL WITH HYDROGEN—Blowing hydrogen gas at high velocity through specially constructed hollow generator coils is said to make it possible to increase turbogenerator ratings by as much as one half. Particularly applicable to units for ratings of 90,000 kw and up, the method reduces to almost zero the heat flow through the coil insulation. Thus the temperature of the copper coils is determined by the temperature of the gas and the heat transfer coefficient from copper to hydrogen. Therefore, for a given maximum temperature rise, it will be possible to pass more current through the coils. Westinghouse is enthused over the deal.

MORE USES FOR WOOD OF LIFE—Lignum vitae reportedly is being substituted for critical materials and plastics in mechanical and diversified industrial applications. It is the hardest and heaviest wood that grows, having origin in the tropics and being imported in log form. One-third of its volume is natural resin, supplying a self-lubricating quality which has made it a popular choice for water lubricated bearings in marine and steel mill equipment. Specific gravity is 1.3, modulus of rupture 11,200 psi, maximum crushing strength 10,480 psi, and working pressures of 2000 psi can be supported handily. Lignum vitae has good resistance to mild corrosive attack, can be machined dry with conventional equipment to fairly close tolerances. It is not recommended for use without coolant at over 150° F.

WANT A WATER-BURNER?—Two Salt Lake City "inventors" are ready to collect a few million dollars from a water-cracking machine they cooked up one evening while trying to keep warm in a neighborhood garage. Nothing to it, according to the sputtering press wires; just pass water through a series of coils heated by any kind of fuel and—bingo—out comes hydrogen and oxygen. They have even been incorporated—for \$100,000—and can now be found in a laboratory at the Salt Lake airport, if you are interested. Meanwhile pass the spinach! A.H.A.



ONE WORLD IN

Metals specialists from free nations converge to inspect U.S. industrial power in hope of finding solutions to their own problems and to pass along fruits of their research. Shortage of metallics is a universal stumbling block. Steps are being taken to expand and consolidate co-operative metallurgical studies

ONE world metallurgy is a high-sounding phrase and perhaps is one on which the destiny of free nations may rest in part. From a practical standpoint it is probably little more than a distant dream, although the World Metallurgical Congress may provide the initial impetus toward making this dream a reality.

Barriers to metallurgical federation are myriad. Difficulties of language alone are tremendous. Almost complete lack of standardization on specifications for materials, components and finished products, as well as test and inspection methods covering them, is a major hurdle to be cleared. Customs barriers, nationalistic tendencies and the ever-present elements of communism in working classes are other disturbing factors. Insufficiency of managerial and administrative talent holds back the progress of metalworking in many countries, along with shortages either of trained younger engineers or of qualified educators to school them.

Aid in Reverse—The Marshall plan with its billions of dollars of credits advanced to European nations, has been of definite assistance in getting the economic system there off dead center, but it will take a lot more than that to restore robust health to industries on the Continent. In fact, cases can be cited, in France and Italy for example, where Marshall plan funds have worked just the reverse of their intended purpose. A company would install some American-

made equipment and train employees in its operation, only to have communists whisper to workers, in effect: "See, that is why you are starving. Your bosses buy American machines and our country's machine-building industry dies."

The crying need for standardization and uniformity of nomenclature is evidenced throughout Europe. Take the case of the big Ansaldo plants in northern Italy. There are 12 of them, employing around 20,000, and building steam boilers, turbines and diesel engines, the latter in stationary types up to 22,000 hp and in smaller units for naval and maritime craft, ranging in horsepower from 10 to 1800. Recently one of the company's plants received an order from Yugoslavia for ten engines to be installed in small fishing boats. The engines were all built up and in stock, ready for shipment. They were made to specifications of the Italian registry; however, the buyer was forced to insist on their meeting French specifications for such power plants. To fill this requirement would have meant literally cutting apart one engine for destructive tests, then perhaps modifying the rest. The result was a complete impasse—the Yugoslavian buyers waiting with money in hand, the engines ready to be shipped, but no common meeting ground on specifications. Result: No sale.

In specifying various types of steel, particularly welding grades, and in establishing test limits, on



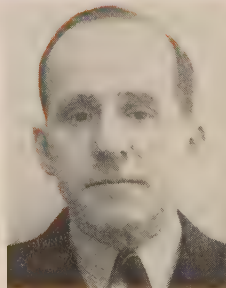
ALAN LECKIE
British Iron & Steel Research
Association
London, England

... teams join in open-hearth
flame radiation studies



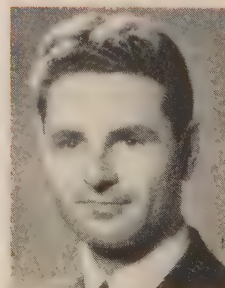
KAJ ARN
Northern Cable & Wire Works
Copenhagen, Denmark

... too little competition, short-
age of managers



LOUIS DU ROY DEBLIEQUY
Trust Metallurgique, Electrique
et Industriel
Brussels, Belgium

... hope is high, but problems
continue to vex



HOWARD KNOX WARNER
Professor of Metallurgy,
University of Melbourne
Melbourne, Australia

... coal is the serious bottle-
neck "down under"

METALLURGY?

weldments, there is complete confusion: George Rappini of Ansaldo, for his own information, has spent a couple of years trying to correlate steel analyses and properties between French, German, Belgian, British and Italian steel sources, resulting in a maze of data that almost defies interpretation. He is plugging hard for the development of a single "nomenclature" for carbon and alloy steels, for mechanical tests and the type of test specimen to be used.

How to Organize?—In this work, as well as in the organization of training methods for professional engineers and metallurgists, there has been the untiring effort of Prof. Antonio Scortecchi of the University of Genoa. He has been a guiding force in the founding of the Instituto Siderurgico which in the past two years has greatly accelerated its program of training and placing metallurgical engineers, and of gathering, analyzing and distributing results of metals research. Scortecchi is an Italian conferee to WMC and he told STEEL that he is in this country primarily to learn the best methods for organizing metallurgical research and the appropriations which various companies make for research in proportion to their business volume.

His work has been difficult, he notes, but he feels strongly that an "international" clarification of metallurgical technology should be worked out between technical societies and institutes of the U. S. and Europe.

Eager to Inspect Mass Production—In general, the metals production and fabrication industries of Europe are small by contrast to this country. They are more of the job shop type, with many different products being processed on the same equipment by retooling or readjusting. Naturally, plant operators there all

IN SUMMARIZING collective opinions of 200 metallurgists, engineers, managers, technical directors, educators and administrators of the metals industries from 21 nations of the world, a vastly complex assortment of ideas must be blended. Out of them comes hope for strengthened industrial techniques throughout the free nations, tempered by the realization that problems everywhere are enormous and the reliance being placed on American methods, equipment and management for help is almost universal. "Conferees" to the forthcoming World Metallurgical Congress in Detroit began arriving in New York in mid-September, spending a few days there preparatory to splitting up into eight "teams" and embarking on study tours of principal industrial centers, all terminating in Detroit in time for the opening gun of the Congress late this week.

Interviews with a representative cross section of the conferees, revealed to STEEL's editors some of the thinking, the prejudices, the desires, the confusions occupying the attentions of leading metals specialists in widely scattered sections of the world. The effort is made here to present them in a sort of symposium, avoiding direct quotations which linguistic difficulties might make embarrassing. The experts pictured on these pages were among the principals contributing to the discussions.

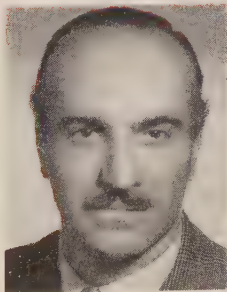
Austria, Australia, Belgium, Brazil, Denmark, Finland, France, Germany, Greece, Holland, India, Italy, Japan, Luxemburg, Norway, New Zealand, Portugal, Sweden, Switzerland, Turkey and the United Kingdom were the countries represented. Arrangements were handled by an enlarged staff of the American Society for Metals, with the active assistance of the Department of State and the Economic Co-operation Administration. The ECA participated by making a substantial grant of funds under Technical Assistance Project No. 80, the largest of its kind ever attempted.

Mechanics of receiving the conferees, assigning them to hotel rooms, assembling them into their respective groups, arranging for currency conversion and other incidentals to handling a large group, many of whom had never visited the U.S. before, called for some exceptionally thorough staff work.



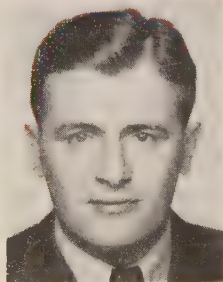
BENGT KJERRMAN
Research Director, Svenska
Kullagerfabriken (S.K.F.)
Gothenburg, Sweden

... induction hardening carbon steels to conserve alloys



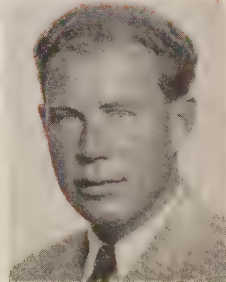
GEORGE RAPPINI
Ansaldo SA Engineering Shops,
Genoa, Italy

... one ship has to pass 14 different sets of welding tests



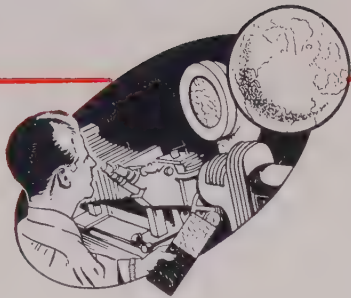
HANS REICHERT
Liesing Boscham & Co.
Wein, Austria

... an oversupply of university-trained engineers in Austria



THORSTEIN KAVLI
A/S Stavanger Tinfabrik
Stavanger, Norway

... plants are small, standardization of nomenclature needed



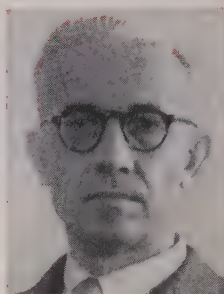
have been told the story of mass production and the continuous moving assembly line so characteristic of this country. They were all anxiously waiting to see these assembly lines in the flesh, to note what phases of this type of operation might be adapted to their own needs in the interests of reducing costs and manual effort. At the same time, they feel that U. S. plants, particularly the smaller ones, may possibly be able to benefit from European experience with trying to make money on "batch-type" operations.

As one British steel research expert put it, many Europeans know second-hand of American accomplishments in low-cost mass production, but must appreciate that these techniques cannot literally be copied and transferred to Europe. The foreign conferees must learn not only what the advantages of repetitive production are, but also the "snags" to be avoided.

Band Together on Research—One encouraging aspect is the definite reawakening of co-operative research programs among western European nations. Thus, France, England, Sweden, Holland and Belgium are sending teams of metallurgists to study various phases of flame radiation in the open hearth. The work is supervised by a joint committee of two from each country. Small model furnaces have been constructed and each team tackles one part of the overall program. A similar study on the low-shell blast furnace, supplied with an enriched blast, is being undertaken by representatives from Greece, England and Belgium, the first experimental unit going up at Liege, Belgium.

Interchange, or perhaps more exactly cross-fertilization, of ideas is coming to be recognized as vital to progress of Europe's metal industries, both ferrous and nonferrous. The question is how far to go; how far can one country properly go in disclosing research and development work it has pioneered to another? That there is this reservation becomes apparent after conversations with many of the foreign visitors. It is inescapable that the World Metallurgical Congress will be principally a one-way street, with most of the ideas flowing from U. S. technicians to their counterparts abroad. On the other hand, the simple fact of meeting face to face with leading engineering and scientific personalities from allied nations could have values for Americans. It helps to understand their viewpoints, to hear why they expect so much from this country, to learn the odds against which many of them seek to work. Officially, of course, politics is off-limits as a topic of discussion, but it takes no shrewd observer to see how politics influences their opinions.

Schooling New Talent—Training of young metallurgists and engineers, both at the university and plant levels, is a subject high in interest throughout



ANTONIO SCORTECCI
*Instituto Siderurgico Finsider
Genoa, Italy*

... set up an international
association of metallurgical
societies



PAUL RIEBENAAM
*Professor, Technical University,
Berlin-Charlottenburg, Germany*

... machine-building industry
wants to "work also with plants
of U.S.A."

the world. Particularly in Britain is there a serious shortage of young trained men. Many plants there are now furloughing their young employees for one or two days a week, with pay, so that they may attend college. National colleges are being established—the National Foundry College is one example—to provide semitrained men with two years of intensive postgraduate instruction in their respective fields. The Ministry of Education is joining with interested manufacturing plants in setting up such programs.

Representatives of the British delegation to WMC, including Alan Leckie and John Pearson of the British Iron & Steel Research Association; Kenneth Barracough of the Brown-Firth Research Laboratory in Sheffield; and Reginald W. Blount of the Ministry of Education were most emphatic on the importance of training activity and made it plain that they were seeking all possible information on co-operative education techniques. One reason why metallurgical training has been rather slow is the indifference of young men to become active in the field. This is perhaps explained by the fact that metallurgy has not been recognized as a profession in Britain. To correct this situation the Institution of Metallurgists has been organized and a strong membership of qualified professional metallurgical engineers is being recruited.

Different Attitude on Research—The British philosophy on research in the metals industries differs from that of the U. S. in that new developments are moved painstakingly through laboratory and pilot stages before being accepted for production. In this country the pressure is for immediate production, with laboratory and experimental work either concluded as quickly as possible or deferred until after a start has been made on production. At least, that is the British viewpoint, and it may be one reason why there has not been more "sponsored" research in Britain of the type done here by Battelle, Mellon and Armour institutes. Further, it may explain why acceptance of boron steels as a means of alloy conservation has been slower in Britain. Metallurgists there are inclined to the view that steels with only residual amounts of alloys can replace higher alloy materials, but they find users slow to be convinced.

A top subject in British steelmaking circles cur-



REGINALD W. BLOUNT

Inspector, Ministry of Education
Derby, England

... taking steps to train more
young metallurgists



KENNETH BARRACROUGH

Brown-Firth Research Laboratory
Sheffield, England

... what about nitrogen to re-
place nickel in alloy steels?



JOHN PEARSON

British Iron & Steel Research
Association
London, England

... co-operate on low-shell blast
furnace research



JAMES PEARCE

British Cast Iron Research
Association
Birmingham, England

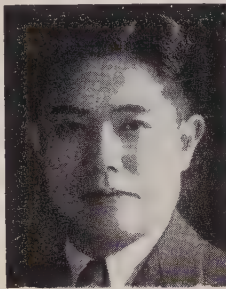
... should not duplication of
scientific effort be recognized
as good?



PAUL BRENNER

Research Laboratory, Vereinigte
Reichmetall Werke
Bonn/Rhein, Germany

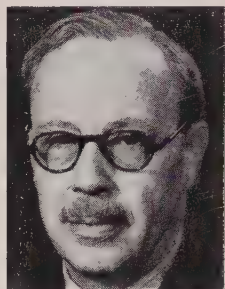
... continuous casting of alum-
inum and copper billets



TUKASA KAWAMURA

Nikko Copper Works
Furukawa Electric Co., Tochigi-
Ken, Japan

... costs too high for exporting
aluminum products



WILLIAM REES

Senior Principal Scientific Officer
National Physical Laboratory
Middlesex, England

... residual amounts of critical
alloys are sufficient



EDWARD FEHLBAUM

OEEC Administrator, Secretary
ECA PROJECT 80
Paris, France

... attention to production
ideas workable in Europe

rently is the reclamation of sulphuric acid from waste pickle liquors and a pilot plant is now going up for production on the basis of one ton of sulphur dioxide a day. Cost estimates, based on the assumption that no cost is involved in the iron sulphate to be processed, indicate that acid can be made at a figure equivalent to new acid on a scale of 10,000 tons a year.

Effects of nitrogen in alloy steel as a means of replacing one or two per cent of critical nickel are being studied actively by British metallurgists, Mr. Barracrough of Brown-Firth for one expressing considerable interest in knowing more about nitrogen. He also was concerned about the change from 18-8 stainless steel to the straight-chromium type in order to conserve nickel. This program has gone considerably further in the U. S. than in Britain, numerous problems in melting and rolling being encountered.

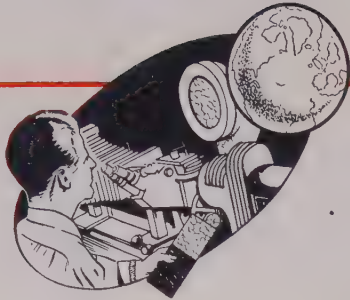
More Induction Hardening—On the subject of alloy conservation, considerable extension of induction hardening of carbon steels to replace full-hardened alloy steels was foreseen. Bengt Kjerrman of S.K.F. in Sweden touched on this trend. He also saw the need for a better interpretation and correlation of metallurgical test data in connection with alloy steels. He wondered whether or not too much reliance was being placed on Magnaflux inspection results. In other words, the rejection of an expensive part because of indicated discontinuities from Magnaflux

tests may not be entirely warranted, if the discontinuity is nothing more than a small slag inclusion.

Danes Have Troubles — Shortages of competent managers and raw materials, too little competition, and the difficulty of persuading labor to make full use of modern machinery are some of the troubles besetting industry in the small nation of Denmark. The country has only 4,000,000 population, of which 25 per cent are gainfully employed. The economy there breaks down into 25 per cent agricultural, 30 per cent industrial, 16 per cent trade and business, 12 per cent handicraft, 7 per cent transport and 10 per cent administrative. The iron and metals industries account for 30 per cent of all industry.

One of the larger industrial plants is Northern Cable & Wire Works at Copenhagen, of which Kaj Arn is manager. He reviewed briefly some of his firm's activity in production of copper, aluminum and brass sheets, tubes and shapes; iron nails, chain and horseshoes. All ingot material has to be imported and the supply falls short of demand.

Northern Cable is furnishing a new type of high-voltage oil-filled submarine cable, the first installation of which was made this summer between Sweden and Denmark for transmitting power at 132,000 volts. The cable is of the flat type, with three conductors side by side. Resilient supporting bands are of corrugated bronze tapes to (Please turn to Page 172)



WHO HAS THE

Self-sufficiency is myth. All industrial nations must import many of the metals they need. United States and Russia hold edge over other contenders for power in volume and diversity of mineral resources

NO NATION in the world is self sufficient in metals.

Only two countries, the United States and Russia, have sufficient of the basic minerals within their borders or spheres of influence to expand and develop their economies in keeping with their land areas, populations and positions of assumed influence. They likely will be rivals for generations, barring war that would destroy one or the other.

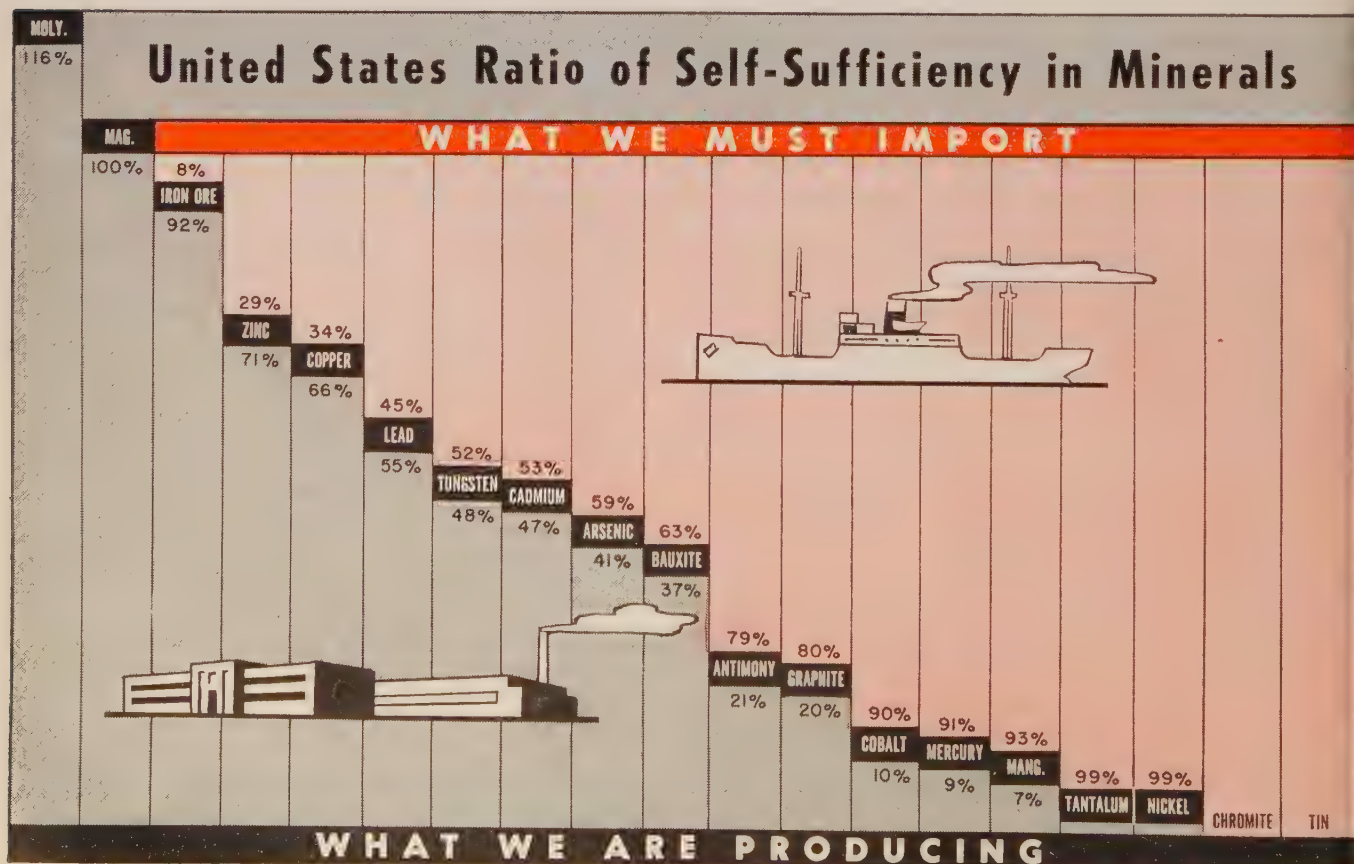
These two facts become apparent through study of the world's metals and minerals. By accident of nature, some countries are more richly endowed with metal resources than others, but all countries depend on imports for a large portion of the metals they need. The rival positions of the United States and Russia result not only from the richness and diversity of their mineral resources but because of all the contenders for power, they are the only two built on continental proportions.

U. S. Has Edge—The United States holds vast ad-

vantages over Russia. Its development is many years ahead of that of the USSR. Our steelmaking capacity, a good index of industrial might, is three times that of Russia. Our sphere of influence is greater, and we have access to friendly neighbors who can supply us with most of the raw materials we must import. Within our borders, known resources in metals are greater than the known resources of Russia.

Now Have Less—But guard against any feeling of complacency. Two World Wars and now a vast armament program have taken their toll of this nation's mineral resources. A generation ago, we began to draw increasingly upon foreign sources for many strategic and critical materials. During the unparalleled activity of the past ten years, we have so accelerated our consumption of iron ore, copper, lead, zinc and other metals that the United States is a have-less nation.

Take a look at the self-sufficiency chart below.



WORLD'S METALS

The chart, based on Bureau of Mines estimates for 1951, shows we are self-sufficient in only two of the metals listed—molybdenum and magnesium. Percentagewise, we depend on other countries for approximately half the meals we consume. Many of those in which we are most deficient must come half way across the world.

We Look Abroad—Until some time between the wars we were self-sufficient in copper, lead and zinc. We were exporters of those metals. Now we must import from a third to a half of our requirements. The change is due not only to the depletion of domestic resources but also to the tremendous expansion in consumption. Fortunately, most of our imports of copper, lead, and zinc come from the Western Hemisphere.

Who Has the Metals?—Tables on the following pages show the world production of 18 important metals for 1950.

The United States is the leading producer of iron ore, copper, aluminum, lead, zinc, magnesium, molybdenum and cadmium. It is second in the production of tungsten.

Russia is the leading producer of manganese and chromite and is second in iron ore, nickel and magnesium.

Canada is by far the largest producer of nickel and rates second in zinc and aluminum. Mexico and South American countries produce important quantities of copper, zinc, lead, molybdenum, cadmium and antimony. Bolivia produces tin.

Other essential meals are most abundant in Africa and Asia. Malaya is No. 1 in tin and tantalite. The Belgium Congo, Nigeria, Rhodesia, and Gold Coast and other African countries hold important reserves of cobalt, columbite, vanadium, manganese and chrome. China is the leading producer of tungsten.

No country on the list has all the elements necessary to produce all the metals required in today's economy—either for peace or for war.



West Holds Advantage—The tables show that the Western Hemisphere is well fixed in iron ore, copper, lead, zinc, aluminum, magnesium, nickel, molybdenum and cadmium.

But the accident of nature was not so kind to this side of the world in manganese, chromite, columbite, tantalite, tin, tungsten and antimony.

Free World vs. Commies—If we compare the metal production of the countries of the free world with those under Russia's influence (see chart at right), the superiority of the free world is apparent. This picture, of course, could change rapidly and substantially in the event of war launched by Russia. That country then probably could seize the resources and productive capacities of some countries of the now-free world.

U. S. Largest Consumer—The United States with roughly 6 per cent of the world's land area and 6 per cent of the world's population consumes more than 50 per cent of the world's metals. For many years, the supply of meals caused little concern. We drew from our large resources and could readily import those which we needed but did not have within our borders.

Now the situation has changed. We are increas-

 FREE NATIONS	BOX SCORE OF WORLD METAL PRODUCTION (1950)	 COMMUNIST NATIONS
(Net Tons Unless Otherwise Specified)		
203,000,000 (Gross Tons)	IRON ORE	37,000,000 (Gross Tons)
1,391,000	ALUMINUM	240,000
2,510,000	COPPER	245,000
2,048,000	ZINC	150,000
1,571,000	LEAD	131,000
36,805	MAGNESIUM	7,275
132,276	NICKEL	27,558
1,949,000	CHROMITE	560,000
18,370	TUNGSTEN	12,220
162,400 (Gross Tons)	TIN	12,000 (Gross Tons)
3,730,000	MANGANESE	2,322,500
15,430	MOLYBDENUM	664
47,400	ANTIMONY	7,717
12,313,000 (Pounds)	CADMIUM	165,000 (Pounds)



Data on world mine production of metals were obtained from various sources, including: Bureau of Mines; American Bureau of Metal Statistics; British Iron & Steel Federation; Economic Cooperation Administration; U. S. Department of Commerce; International Tin Study Group; the Metal Bulletin, London; and STEEL's correspondents abroad. Some figures, particularly for Russia and its satellites, are estimated on the basis of best available information. World totals estimated to include production in countries for which statistics are not available.

ingly dependent on imports. And some of our former sources of supply have been cut off.

Today, the most puzzling problem throughout the metalworking industry, and in the defense planning offices in Washington, is metals shortages. The supply of most of the important tonnage metals is less than the demand. And many of the strategic metals are causing grave concern.

The National Production Authority lists the following in "very short supply": Aluminum, copper, lead, magnesium, titanium, tin, zinc, cobalt, molybdenum, nickel, tantalum, columbium, tungsten, selenium, platinum, iridium, and osmium.

1950 WORLD MINE

IRON ORE

Gross Tons

United States	98,041,094
Russia	34,447,350
France	29,726,094
Sweden	13,707,092
United Kingdom	12,937,440
Germany	10,710,173
Luxemburg	3,784,287
Canada	3,256,750
India	2,952,630
Chile	2,929,008
Algeria	2,532,372
Australia	2,365,056
Spain	2,046,172
Brazil	1,869,999
Austria	1,829,646
Czechoslovakia	1,574,736
Union of S. Africa	1,170,225
Sierra Leone	1,166,288
Japan	895,631
Spanish Morocco	846,420
Yugoslavia	787,368
Poland	777,525
Tunisia	746,031
Philippines	589,541
Malaya	498,994
Italy	435,020
Norway	423,210
Mexico	413,368
Rumania	388,762
Hungary	362,189
French Morocco	313,962
China	246,052
Turkey	230,305
Venezuela	186,999
Hong Kong	166,331
Portuguese India	128,931
Southern Rhodesia	56,099
Switzerland	54,131
Belgium	45,273
Greece	40,352
New Caledonia	14,763
Cuba	11,810
World Total	240,000,000

LEAD

Net Tons

United States	429,875
Mexico	247,069
Australia	231,971
Canada	169,888
Russia	123,000
Peru	67,251
French Morocco	53,136
Germany	49,533
Italy	42,230
Spain	41,753
Bolivia	34,396
South West Africa	29,802
Sweden	25,975
Argentina	25,400
Tunisia	21,240
Rhodesia	15,355
France	12,115
Japan	11,963
Czechoslovakia	6,000
Austria	4,894
United Kingdom	3,381
Greece	2,543
Fr. Equatorial Africa	2,000
Algeria	1,560
China	1,200
India	701
Hungary	400
World Total	1,702,000

NICKEL

Net Tons

Canada	123,057
Russia	27,557
New Caledonia	6,944
Union of S. Africa	929
United States	912
World Total	159,834

VANADIUM

Net Tons

Peru	48
South West Africa	32
United States	n.a.
Northern Rhodesia	17

*Not available for security reasons.

TIN

(Gross Tons)

Malaya	57,500
Indonesia	32,000
Bolivia	31,200
Belgian Congo	13,700
Thailand	10,300
Nigeria	8,200
Russia	8,000
China	3,600
Australia	2,400
Burma	1,600
United Kingdom	900
Union of S. Africa	700
Portugal	600
Spain	500
Canada	300
Japan	300
Argentina	300
Mexico	200
Brazil	200
Uganda	100
Tanganyika	100
Germany	100
South West Africa	100
United States	100
France	100
Peru	100
French Cameroon	100
Southern Rhodesia	100
Indochina	100
Swaziland	100
Northern Rhodesia	100
World Total	174,400

In Group II on the critical list (in approximate balance) are antimony, bismuth, cadmium, germanium, tellurium, chromium, manganese, silicon and vanadium. Considering the strategic position of many of the latter metals, we may have future trouble in maintaining our supply of them.

Group III metals (in good supply) are mercury, gold, palladium, rhodium, silver, boron, calcium, ferro-titanium and zirconium.

Iron and steel products fall in all three groups, but the overall supply is short.

What's the Answer?—The solution to our national metals shortage may be found in the following ac-

tions, all of which are receiving attention in steel mills, metallurgical laboratories and manufacturing plants, in mines and in the defense offices:

1. Find and develop new domestic sources.
2. Develop new sources in friendly, accessible countries.
3. Stretch available supplies.
4. Search for practical substitutes.

New Sources—Metals come from mines, which have to be discovered. They require facilities which cannot be expanded as fast as can a manufacturing plant. Often, the metal find is in a remote area and before it can be developed transportation must be

PRODUCTION OF METALS

COPPER

Net Tons

United States	915,500
Chile	399,867
Rhodesia	314,589
Canada	261,914
Russia	240,000
Belgian Congo	193,917
Mexico	65,266
Yugoslavia	44,100
Japan	43,345
Union of S. Africa	36,848
Prussia	31,884
Peru	30,702
Cuba	22,663
Ireland	18,993
Sweden	17,746
Australia	17,540
Norway	16,975
Turkey	12,793
Philippines	11,446
South West Africa	10,678
Spain	7,498
India	7,408
Bolivia	5,185
Austria	1,808
Germany	1,500
China	1,400
Ecuador	580
Hungary	400
Italy	60
World Total	2,755,000

COLUMBITE

Concentrates in Pounds

Nigeria	1,935,360
Belgian Congo	297,675
Mozambique	77,700
Uganda	11,200
United States	4,000
French East Africa	3,660

MANGANESE

Net Tons

Russia	2,204,620
Union of S. Africa	871,857
Gold Coast	784,200
India	748,648
French Morocco	316,655
Brazil	179,235
Egypt	167,737
Japan	147,782
United States	140,200
Cuba	86,975
Hungary	44,092
Mexico	35,714
China	33,069
Philippines	32,922
Chile	27,031
Rumania	24,250
Portuguese India	22,204
Turkey	22,046
Spain	18,739
Belgian Congo	18,728
Italy	17,866
Korea	16,534
Australia	16,191
Angola	10,260
New Caledonia	2,030
Portugal	879
Spanish Morocco	826
Fiji	223
World Total	6,062,705

ZINC

Net Tons

United States	618,207
Canada	311,225
Mexico	201,095
Australia	186,284
Russia	141,900
Belgian Congo	84,119
Peru	81,364
Italy	78,166
Germany	76,389
Spain	69,897
Japan	57,355
Sweden	40,471
Rhodesia	25,442
Bolivia	21,572
Argentina	13,998
French Morocco	12,584
France	11,162
South West Africa	9,288
Algeria	7,866
Norway	7,606
Yugoslavia	5,000
Greece	3,510
Austria	3,274
Tunisia	3,232
Rumania	3,000
Fr. Equatorial Africa	685
World Total	2,198,000

MOLYBDENUM

Net Tons

United States	14,239
Chile	881
China	661
Norway	68
Canada	30
Australia	3
World Total	16,094

TANTALITE

Concentrates in Pounds

Malaya Union	17,920
Australia	14,996
South West Africa	12,570
Southern Rhodesia	1,700
United States	n.a.

(Please turn to next page)



built to the site. In mining, you have to sink shafts and this work may have to await transportation. You cannot do development work at the bottom of the shaft until you have it down to where you want to

go. Shaft sinking is necessarily slow. Then before the mine can be put into production, the workings from which the production is to come must be developed and the facilities needed to concentrate the ore built. In most cases the development of new sources for metals requires years.

If the new finds are in other countries, contracts for development of the finds must be negotiated. Any mining executive experienced in foreign development can testify such negotiations can be tough and time-consuming.

Conservation—How to stretch available supplies
(Please turn to Page 143)

1950 WORLD MINE PRODUCTION OF METALS—continued

CHROMITE

Net Tons

Russia	551,155
Union of S. Africa	547,102
Turkey	385,808
Southern Rhodesia	321,350
Philippines	276,140
Cuba	129,364
Yugoslavia	110,231
Japan	35,222
Pakistan	19,841
Greece	13,923
Bulgaria	8,818
United States	425
Guatemala	330
World Total	2,509,959

CADMIUM

Pounds

United States	9,304,061
South West Africa	1,731,400
Mexico	1,515,800
Canada	832,464
Australia	632,726
United Kingdom	261,331
Japan	198,765
Russia	165,000
Italy	92,400
Belgian Congo	79,200
World Total	12,478,400

MAGNESIUM

Net Tons

United States	15,725
Russia	6,613
United Kingdom	5,401
Canada	1,770
China	661
France	330
World Total	44,080

TUNGSTEN

Concentrates containing 60 per cent WO₃
Net Tons

China	12,125
United States	4,853
Portugal	2,755
Bolivia	2,712
Russia	1,653
Thailand	942
Spain	898
Brazil	771
Burma	661
Australia	491
France	440
South Korea	440
Peru	429
Sweden	399
Uganda	239
Belgian Congo	180
Union of S. Africa	105
Mexico	73
Japan	70
Southern Rhodesia	70
United Kingdom	67
Malaya	29
Finland	22
Tanganyika	16
French Morocco	7
Nigeria	5
South West Africa	4
Italy	2
World Total	30,590

COBALT

Net Tons

Belgian Congo	5,674
Northern Rhodesia	738
French Morocco	429
United States	329
Canada	313
Australia	11
World Total	7,826

ANTIMONY

Net Tons

Bolivia	9,570
Union of S. Africa	9,149
Mexico	6,468
China	3,747
United States	2,496
Czechoslovakia	2,204
Turkey	1,763
Hungary	1,708
Greece	1,658
Algeria	1,598
French Morocco	738
Austria	450
Italy	440
Spain	440
France	363
Canada	325
Australia	244
Japan	177
Thailand	110
Russia	55
Southern Rhodesia	26
World Total	55,115

ALUMINUM

Net Tons

United States	718,617
Canada	394,626
Russia	209,438
France	67,240
Norway	51,391
Italy	40,862
United Kingdom	33,004
Switzerland	23,148
China	19,841
Austria	19,828
Hungary	6,613
Sweden	4,409
India	4,023
Korea	3,306
Yugoslavia	2,755
Spain	2,388
World Production	1,631,000



American Society for Metals

PROGRAM

All Sessions at Hotel Statler

METALLURGISTS and metal production executives representing 29 free nations will converge on Detroit next week for the first World Metallurgical Congress and the 33rd National Metal Congress and Exposition. During the five days from Oct. 15-19, they will visit the show at Michigan State Fair Grounds and attend technical sessions sponsored by the American Society for Metals; American Welding Society; Metals Branch, American Institute of Mining and Metallurgical Engineers and Society for Non-Destructive Testing.

The exposition this year is housed in seven separate buildings and occupies about 6½ acres of floor space. 400 metalworking firms are exhibiting.

1951-52 National officers of the participating technical societies are: American Society for Metals: President, John Chipman, head, Dept. of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.; vice president, Ralph L. Wilson, director of metallurgy, Steel & Tube Division, Timken Roller Bearing Co., Canton, O.; treasurer, Ralph L. Dowdell, head, Department of Metallurgy, University of Minnesota, Minneapolis, secretary, W. H. Eisenman, ASM Headquarters, Cleveland.

American Welding Society: President, C. H. Jennings, Westinghouse Electric Corp., Buffalo; first vice president, F. L. Plummer, Hammond Iron Works, Warren, Pa.; secretary, J. G. MacGrath, AWS Headquarters, New York.

American Institute of Mining & Metallurgical Engineers: Nominated for 1952: President, Michael Lawrence Haider, vice president, Imperial Oil Ltd., Toronto, Canada; secretary, E. H. Robie, AIMME Headquarters, New York; chairman, Institute of Metals Branch, Walter A. Dean, works chief metallurgist (Cleveland) Aluminum Co. of America; secretary, Institute of Metals Branch, Ernest O. Kirkendall, AIMME Headquarters, New York.

Society for Non-Destructive Testing: President, W. E. Thomas, vice president in charge of sales and field engineering, Magnaflux Corp., Chicago; secretary, Philip D. Johnson, National Headquarters, Evanston, Ill.

American Society for Metals

Seminar on Metal Interfaces

Sessions at Hotel Statler

Saturday Morning, Oct. 13

Theoretical Considerations

Atomistic Theory of Metallic Surfaces, by Conyers Herring, Bell Telephone Laboratories.
Theory of Internal Boundaries, by Harvey Brooks, Cruft Laboratory, Harvard University.
Grain Shapes and Other Metallurgical Applications of Topology, by Cyril Stanley Smith, director, Institute for the Study of Metals, University of Chicago.

Saturday Afternoon, Oct. 13

Interfacial Energies

Measurement of Solid: Liquid and Solid: Gas Interfacial Energies, by Harry Udin, Department of Metallurgy, Massachusetts Institute of Technology.
Measurement of Solid: Solid Interfacial Energies, by James B. Hess, Kaiser Aluminum and Chemical Corp.
Energies and Structure of Grain Boundaries, by Karl T. Aust, Kaiser Aluminum and Chemical Corp. and Bruce Chalmers, University of Toronto.

Sunday Morning, Oct. 14

Movements of Interfaces

Kinetics of Recrystallization, by David Harker, director, protein structure project, Brooklyn Polytechnic Institute.
Interfacial Movements During Recrystallization, by Paul A. Beck, chairman, Department of Metallurgy, University of Notre Dame.
Interfacial Movements During Grain Growth, by Robert L. Fullman, Research Laboratory, General Electric Co.
Relative Interfacial Movements, by Arthur S. Nowick, Department of Metallurgy, Yale University.

Sunday Afternoon, Oct. 14

Effects of Interfaces

Phase Transformations at Interfaces, by Alfred H. Geisler, Research Laboratory, General Electric Co.
Mechanical Property Effects of Interfaces, by Bruce Chalmers, Department of Metallurgical Engineering, University of Toronto.
Phenomena at Surfaces, by Herbert H. Uhlig, Department of Metallurgy, Massachusetts Institute of Technology.

World Metal Resources

Opening Session of World Metallurgical Congress

Sunday, Oct. 14, 8:00 p.m.

Ballroom, Hotel Statler

*Presiding: Zay Jeffries, Director-General,
World Metallurgical Congress*

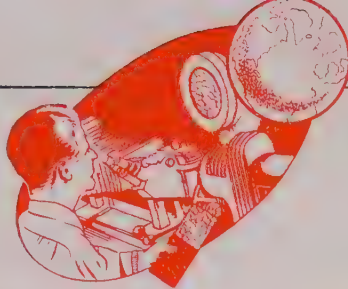
Raw Materials for the Metal Industry, by James Boyd, formerly administrator of defense minerals, U. S. Department of Interior, Kennecott Copper Corp.
Defense Metal Conservation and Substitution, by K. P. Harten, executive secretary Vereins Deutscher Eisenhüttenleute (German Iron and Steel Institute.)
Metals for Defense in ECA Countries. Speaker to be announced.
Metals for Defense in Non-ECA Countries of the Free World, by Clyde Williams, director, Battelle Memorial Institute, Columbus, O.

World Metallurgical Congress Sessions

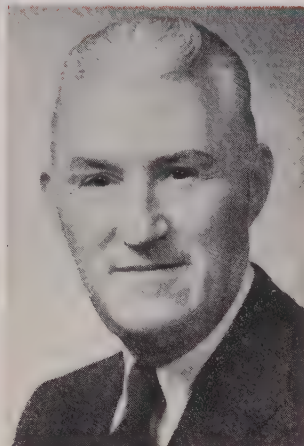
Monday, Oct. 15, 9:30 a.m.

Constitution Diagrams Session

Constitution and Properties of Cobalt-Iron-Vanadium Alloys, by D. L. Martin and A. H. Geisler, General



JOHN CHIPMAN
President, American Society for
Metals, 1951-52



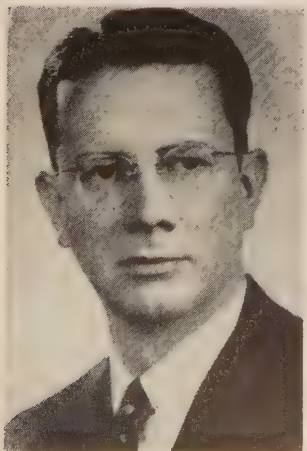
RALPH L. WILSON
Vice-President, American Society
for Metals, 1951-52



RALPH L. DOWDELL
Treasurer, American Society for
Metals, 1951-52



GWILYM A. PRICE
Recipient, ASM Medal for
Advancement of Research



DR. ROBERT F. MEHL
Recipient, ASM Albert Sauveur
Achievement Award



DR. PAUL MERICA
Recipient, ASM Gold Medal

Electric Research Laboratories, Schenectady, N. Y.
Phase Relationships in the Iron-Chromium-Vanadium System, by Howard Martens, research engineer, and Pol Duwez, associate professor of mechanical engineering and chief, materials section, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif.

A Partial Titanium-Chromium Phase Diagram and the Crystal Structure of $TiCr_2$, by Pol Duwez, associate professor of mechanical engineering and chief, materials section, and Jack L. Taylor, research engineer, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif.

Titanium-Silicon System, by M. Hansen, supervisor, and H. D. Kessler and D. J. McPherson, research metallurgists, nonferrous metals research, Armour Research Foundation, Chicago.

Indium-Antimony System, by T. S. Liu, teaching fellow, and E. A. Peretti, professor of metallurgy, University of Notre Dame, Notre Dame, Ind.

Monday, Oct. 15, 9:30 a.m.

Melting and Refining Session

A Proposed Steel Making Process, by A. Reggiore, Milan, Italy.

A New Process for Direct Reduction of Iron Pyrites, by A. Scortecchi, Genoa, Italy.

A Rapid Analytical Method for Hydrogen in Steel, by Y. Ishihara and S. Sawa, Kamakura, Japan.

Basic Bessemer Steel With Low Nitrogen and Phosphorus, by P. Coheur, Liege, Belgium.

Phosphorus Deoxidation of Molten Copper, by W. A. Baker, Surry, England.

Monday, Oct. 15, 2:00 p.m.

Diffusion Session

Interstitial Diffusion, by A. G. Guy, associate professor of mechanical engineering, University of North Carolina, Raleigh, N. C.

Carbonitriding of Carbon and Alloy Steels, by H. C. Fiedler, M. B. Bever and C. F. Floe, Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

Chromium Diffusivity in Alpha Cobalt Chromium Solid Solutions, by John W. Weeton, research metallurgist, Lewis Flight Propulsion Laboratory, National Advisory Committee for Aeronautics, Cleveland.

Anisothermal Diffusion of Carbon in Austenite, by J. E. Black, Captain, Ordnance Department, U. S. Army, Detroit Arsenal, Detroit, and G. E. Doan, professor and head, Department of Metallurgical Engineering, Lehigh University, Bethlehem, Pa.

Tuesday, Oct. 16, 9:30 a.m.

High Temperature Alloys Session

Formation of Sigma Phase in 13 to 16% Chromium Steels, by H. S. Link and P. V. Marshall, U. S. Steel Co., Research & Development Laboratory, Pittsburgh.

Electrolytic Etching—The Sigma Phase Steels, by John J. Gilman, Crucible Steel Co. of America, Research Laboratory, Harrison, N. J.

Phase Changes Associated With Sigma Formation in 18-8-3-1 Chromium-Nickel-Molybdenum-Titanium Steel, by K. W. Bowen and T. P. Hoar, Cambridge, England.

Composition Limits of Sigma Formation in Nickel-Chromium Steels at 1200° F (650° C), by M. E. Nicholson, assistant professor, The Institute for the Study of Metals, University of Chicago, Chicago, C. H. Samans, associate director, Materials Division, Standard Oil Co. (Indiana), Chicago, and F. J. Short, sleeve, research assistant, Case Institute of Technology, Cleveland.

Ferrite Formation Associated with Carbide Precipitation in 18-Cr-8-Ni Austenitic Stainless Steel, by E. J. Dulis and G. V. Smith, research laboratory, U. S. Steel Co., Kearny, N. J.

Tuesday, Oct. 16, 9:30 a.m.

Mechanical Metallurgy Session

Determination of Flow Stress From a Tensile Specimen, by E. R. Marshall, instructor of metallurgy, and M. C. Shaw, associate professor of mechanical engineering, Massachusetts Institute of Technology, Cambridge, Mass.

Plastic Deformation of Zinc Bicrystals, by T. Kawada, Tokyo, Japan.

Mechanical Properties of Iron and Some Iron Alloys of High Purity, by W. P. Rees, Middlesex, England.
 Crystal Orientation in Cold-Rolled Silicon Steel Sheet, by I. Gokyu and H. Abe, Tokyo, Japan.
 Delayed Yield in Annealed Steels of Very Low Carbon and Nitrogen Content, by D. S. Wood, assistant professor, and D. S. Clark, associate professor, Department of Mechanical Engineering, California Institute of Technology, Pasadena, Calif.

Tuesday, Oct. 16, 2:00 p.m.
High Temperature Alloys Session

Cast Heat Resistant Alloys of the 21% Chromium-9% Nickel Type, by Howard S. Avery, research metallurgist, Charles R. Wilks, metallurgist, and John A. Fellows, research metallurgist, American Brake Shoe Co., Mahwah, N. J.
 Influence of Extended Time on Creep and Rupture Strength of 16-25-6 Alloy, by C. L. Clark and M. Fleischmann, metallurgical engineers, Steel & Tube Division, Timken Roller Bearing Co., Canton, O., and J. W. Freeman, research engineer, Engineering Research Institute, University of Michigan, Ann Arbor, Mich.
 Isothermal Transformation, Hardening and Tempering of 12% Chromium Steel, by R. L. Rickett, Research Laboratory, U. S. Steel Co., Kearny, N. J., W. F. White, U. S. Steel Co., Pittsburgh, C. S. Walton, U. S. Steel Co., Pittsburgh, and J. C. Butler, South Works, U. S. Steel Co., S. Chicago, Ill.
 Cladding of Molybdenum for Service in Air at Elevated Temperature, by W. L. Bruckart, research engineer, and R. I. Jaffee, supervisor in nonferrous physical metallurgy, Battelle Memorial Institute, Columbus, O.

Wednesday, Oct. 17, 9:30 a.m.
ASM Annual Meeting

Edward DeMille Campbell Memorial Lecture

Wednesday, Oct. 17, 2:00 p.m.
Embrittlement Session

Effects of Decomposition of Retained Austenite During Tempering on Notch Toughness and Tensile Properties, by E. F. Bailey and W. J. Harris, Jr., members of ferrous alloys branch, Naval Research Laboratory, Washington.
 Comparison of the Effects of Alloying Elements on the Lower and Upper Transition Temperatures in Pearlitic Steel, by J. A. Rinebolt and W. J. Harris, Jr., Ferrous Alloys Branch, Naval Research Laboratory, Washington.
 Effect of Retained Austenite Upon Mechanical Properties, by L. S. Castleman, Atomic Power Division, Westinghouse Electric Corp., Pittsburgh, B. L. Averbach, assistant professor of physical metallurgy, and Morris Cohen, professor of physical metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.
 Some X-Ray Diffraction and Electron-Microscope Observations on Temper-Brittle Steels, by S. R. Maloof, research metallurgist, Springfield Armory, Springfield, Mass.

Thursday, Oct. 18, 9:30 a.m.
Mechanical Metallurgy Session

Strain Aging Effects, by J. D. Lubahn, Metallurgy and Ceramics Divisions, General Electric Co., Research Laboratory, Schenectady, N. Y.
 Fatigue Strength of Large, Notched Steel Bars Surface Hardened by Gas Heating and Induction Heating, by S. L. Case, J. M. Berry and H. J. Grover, Battelle Memorial Institute, Columbus, O.
 Deep Drawing Limits for Rectangular Boxes, by T. Ishikawa, Osaka, Japan.
 Elimination of Yield Point Phenomena by Temper Rolling and Roller Leveling, by N. H. Polakowski, Swansea, England.
 Effect of High Heating Rate on the Tensile Properties of Metals, by W. K. Smith, metallurgist, C. C. Woolsey, metallurgist, and W. O. Wetmore, head, metallurgy branch, U. S. Naval Ordnance Test Station, China Lake, Calif.

Thursday, Oct. 18, 9:30 a.m.
High Temperature Phases Session

An Interpretation of the Hysteresis Loops in A_2 and A_1

Transformations of Pure Iron, by K. Honda and M. Sato, Tokyo, Japan.

Magnetic Property Changes in Iron Molybdenum Alloys During Aging, by T. Mishima, R. Hasiziti and Y. Kamura, Tokyo, Japan.

Age Hardening, by T. Mishima, Tokyo, Japan.

Carbide Reactions in High Temperature Alloys, by J. R. Lane, Naval Research Laboratory, Washington and N. J. Grant, associate professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

Allotropy of Cobalt, by A. G. Metcalfe, Delford, Ont., Canada.

Thursday, Oct. 18, 2:00 p.m.
Heat Treatment Session

Stress-Induced Transformation of Retained Austenite in Hardened Steel, by B. L. Averbach, S. G. Lorriss and Morris Cohen, Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.
 An Investigation of the Quenching Characteristics of a Salt Bath, by M. J. Sinnott, associate professor of chemical and metallurgical engineering, and J. C. Shyne, graduate student, Department of Metallurgical Engineering, University of Michigan, Ann Arbor, Mich.
 Limitations of the End Quench Hardenability Test, by A. R. Troiano, professor of physical metallurgy, and L. J. Klinger, senior research associate, Case Institute of Technology, Cleveland.
 A Correlation of End-Quenched Test Bars and Rounds in Terms of Hardness and Cooling Characteristics, by E. W. Weinman, research metallurgist, R. W. Thomson, assistant head, and A. L. Boegehold, head, Department of Metallurgy, General Motors Corp., Research Laboratories Division, Detroit.

Friday, Oct. 19, 9:30 a.m.
Physical Metallurgy Session

Particle Size Analysis of Metal Powders, by C. C. Gregg and Bernard Kopelman, Sylvania Electric Products Inc., Bayside, N. Y.
 Interrelation of Mechanical Properties, Casting Size, and Microstructure of Ductile Cast Iron, by R. W. Kraft and R. A. Flinn, Metallurgy Department, American Brake Shoe Co., Mahwah, N. J.
 Gas Evolution from Gray Cast Iron During Enameling, by L. F. Porter, research metallurgist, and P. C. Rosenthal, professor of metallurgy, Department of Mining and Metallurgy, University of Wisconsin, Madison, Wis.
 Aluminum-6 Per Cent Magnesium Wrought Alloys for Elevated-Temperature Service, by K. Grube, research engineer, and L. W. Eastwood, supervisor, nonferrous metallurgy, Battelle Memorial Institute, Columbus, Ohio.
 A Study of the Microhardness of the Major Carbides in Some High Speed Steels, by P. Leckie-Ewing, metallurgist, Union Twist Drill Co., Butterfield Division, Rock Island, Que., Canada.



American Society for Metals
Educational Lectures

All Sessions Hotel Statler

Two Lecture Courses

All Sessions in Building M, Fair Grounds
Residual Stress Measurements

Monday, Oct. 15—8:00 p.m.

Origin, Nature and Effects of Residual Stresses, by R. G. Treuting, Bell Telephone Laboratories, Murray Hill, N. J.



Measurements of Residual Stresses, by J. J. Lynch, Case Institute of Technology, Cleveland.

Tuesday, Oct. 16—8:00 p.m.

Residual Stress States Produced in Metals by Various Processes, by H. B. Wishart, U. S. Steel Co., Gary, Ind.

Relief and Redistribution of Residual Stresses in Metals, by D. G. Richards, United Aircraft Corp., East Hartford, Conn.

Principles of Heat Treatment

All Lectures by M. A. Grossmann, Director of Research U. S. Steel Co., Pittsburgh

Tuesday, Oct. 16—4:30 p.m.

1. Hardening.
2. Hardenability and Quenching.

Wednesday, Oct. 17—4:30 p.m.

3. Isothermal Diagrams and Martensite.
4. Tempering.

Wednesday, Oct. 17—8:00 p.m.

5. Grain Size.
6. Hardness, Strength and Toughness.



American Welding Society

PROGRAM

All Sessions at Book-Cadillac Hotel

Monday Morning, Oct. 15

Structural Welding

Yield Strength of Welded Continuous Beams, by C. H. Yang and L. S. Beedle, Fritz Engineering Laboratory, Lehigh University and H. G. Johnston, University of Michigan.

Column Strength Under Combined Bending and Thrust, by R. L. Ketter and L. S. Beedle, Fritz Engineering Laboratory, Lehigh University and B. G. Johnston, University of Michigan.

Estimating Weldments and Welded Structural Steel, by Chas. F. Frantz, Lehigh Structural Steel Co.

Surface Conditioning of Structural Steel by Welding, by R. E. Somers and H. C. VonBlohn, Bethlehem Steel Co.

Resistance Welding

Physical and Metallurgical Characteristics of Spot Welding Titanium, by M. L. Begeman, J. C. Fontana and Frank W. McBee, Jr., University of Texas.

Application of Spot and Seam-Welding to Design, by S. P. Jenkins and Thomas E. Piper, Northrop Aircraft Inc.

Spot and Projection Welding Using Magnetic Electrode Force, by William E. Klingeman and H. H. Kruer, Precision Welder and Machine Co.

A Case of Power, by Myron Zucker, Myron Zucker Engineering Co., Jerry Gerald, Midwest Wire Products Co., and Paul Duker, Detroit Edison Co.

Monday Afternoon, Oct. 15

Resistance Welding

Seam Welding Containers Automatically, by C. S. Seltzer, Swift Electric Welder Co.

Spot and Seam Welding of Nimonic and Similar Heat-Resistant Alloys, by J. Solomon, Sciaky Bros. Inc.

Temperature Distribution During the Flash Welding of Steel, by Ernest F. Nippes, W. F. Savage and J. J. McCarthy, Rensselaer Polytechnic Institute.

Weldability

Microcracks and the Low-Temperature Cooling Rate Embrittlement of Arc Welds in Mild Steel, by A. E. Flanigan, professor, Dept. of Engineering, University of California.

Effect of Sub-Critical Cooling Rate on Strain and Quench Aging of Structural Steels, by C. Felmley, C. Hartbower and W. S. Pellini, Metallurgy Division, Naval Research Laboratory.

Nonferrous

Tensile Tests and Metallurgical Studies of Welded Copper Joints, by R. J. Mosborg, R. W. Bohl, F. L. Howland and W. H. Munse, Department of Civil Engineering, University of Illinois.

Welding Iron-Bearing Alpha Aluminum Bronze, by F. Emery Garriott, Ampco Metal Inc.

Pressure Welding Aluminum at Various Temperatures, by M. A. Miller and G. W. Oyler, Aluminum Research Laboratories.

Monday Evening, Oct. 15

President's Reception

Tuesday Morning, Oct. 16

Ship Structure

Work of the Ship Structure Committee, by R. Adm. K. K. Cowart, U. S. Coast Guard.

Low-Carbon Steel: Subcritical Heating vs. Transition Temperatures, by L. J. Klinger, E. B. Evaneskes and Wm. M. Baldwin, Case Institute of Technology.

Studies of Tests for Evaluating Welded Ship Steels, by C. B. Voldrich and P. J. Rieppel, Battelle Memorial Institute.

Stress Studies of Bulkhead Intersections for Welded Tankers, by W. R. Campbell and L. K. Irwin, National Bureau of Standards.

Influence of Composition and Steel-Making Practice Upon Ship-Plate Quality, by H. M. Banta, Battelle Memorial Institute.

Fundamental Studies of Arc Welding

Effect of Power Supply Characteristics on dc Welding, by Jack B. Keyte, Department of Welding Engineering, Ohio State University.

Welding Characteristics of Submerged Arc with Three-Phase Power, by E. A. Clapp, Union Carbide and Carbon Research Laboratories Inc., and Norman G. Schreiner, Linde Air Products Co.

Tools for Predetermining Preheat and Interpass Temperatures for Submerged Arc Welds, by Clarence E. Jackson and Arthur F. Shrubsall, Union Carbide and Carbon Research Laboratories Inc.

Tuesday Morning, Oct. 16

Inspection Trip

Arrangements have been made for an inspection trip to the plants of the Ford Motor Co.

Tuesday Afternoon, Oct. 16

Ship Structure

Welded Reinforcement of Openings in Structural Steel Plates, by D. Vasarhelyi and R. A. Hechtman, University of Washington.

Evaluation of Welding Procedure by Direct Explosion Testing, by G. S. Mikhlapov, Metallurgical Research and Development Co.

Investigation of Factors Which Determine Welded Performance, by C. Hartbower and W. S. Pellini, Naval Research Laboratory.

Upper and Lower Transition in Charpy Tests, by W. J. Harris Jr., J. A. Rinebolt and R. Haring, Naval Research Laboratory.

Hard Facing and Flame Hardening

Control of Rail-End Hardening, by La Motte Grover, Air Reduction Sales Co.

Hard Facing for Impact, by Howard S. Avery, American Brake Shoe Co.

Development of Fused Metallized Coatings, by Harrison S. Sayre, U. S. Naval Engineering Experiment Station.

Resistance Welding

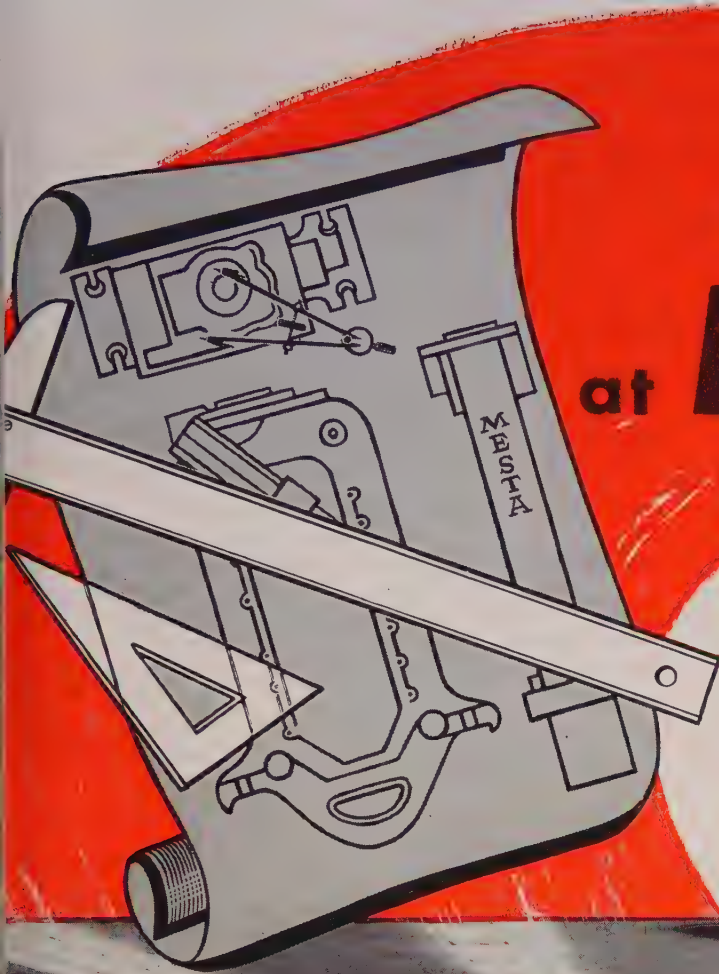
Trends in Electronic Nonsynchronous Resistance Welding Controls, by Stuart C. Rockafellow, Robatron Corp.

Flash Welding of Components for Aircraft and Similar Applications, by J. H. Cooper, Taylor-Winfield Corp.

Fatigue Strength of Spot-Welded Light Alloy Joints, by H. Kihara, president, Japan Welding Society.

Tuesday Evening, Oct. 16

Adams Lecture



ENGINEERING DEPARTMENTS at **MESTA**

A section in one of the Mesta Engineering Departments, where machinery to fit individual requirements is designed and plans for complete plant projects are developed. These include not only designs for the mechanical equipment built by Mesta, but also for buildings, foundations, electrical distribution systems, and all the engineering that is required for the creation of a modern industrial plant.



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY
PITTSBURGH, PENNSYLVANIA



Wednesday Morning, Oct. 17
Production Welding

Welding Heat Exchanger for the Chemical Industry, by John W. Mortimer, professional engineer.
Product Design for Welding, by John Mikulak, Worthington Pump and Machinery Corp.
Welding Fixtures for Use with Submerged Arc, by J. P. Berkeley, Berkeley Equipment Co.

Pressure Vessels

Effect of Fabrication Processes on Steel Used in Pressure Vessels, by Dr. S. S. Tor, J. M. Ruzek, Dr. R. Stout, Lehigh University.
Biaxial Fatigue Tests on Flat Plate Specimens, by R. U. Blaser, L. F. Kooistra and J. T. Tucker Jr., Babcock & Wilcox Co.
Stresses in Large Horizontal Cylindrical Pressure Vessels on Two Saddle Supports, by Leonard P. Zick, Chicago Bridge and Iron Co.

Gas Cutting

Oxygen Cutting of Defense Equipment Materials, by A. H. Yoch, Air Reduction Sales Co.
Heavy Scrap Cutting, by L. P. Elly, Bethlehem Steel Co.
Powder-Washing for Metal Removal, by R. S. Babcock, Linde Air Products Co.

Wednesday Afternoon, Oct. 17
Weldability

Relation of Notch Strains to Bend Angles in the Notched-Bend Test, by A. E. Flanigan, professor, University of California, and Ernest M. Emery, North American Aviation Co.
Repeated Load Tests on Welded and Prestrained Steel, by Dr. S. S. Tor, J. M. Ruzek, Dr. R. D. Stout, Fritz Engineering Laboratory, Lehigh University.
Micro-Mechanism of Fracture in Tension-Impact Test, by W. H. Bruckner, University of Illinois.

Welding and Brazing

Nested Electrodes for Metal Arc Welding, by W. A. Snyder, University of Washington.
Welding in Steel Mill Maintenance During Defense Period, by R. L. Deily, Air Reduction Sales Co.
Dilution and Diffusion Aspects of Brazing, by R. D. Wasserman and Joseph F. Quaas, Eutectic Welding Alloys Corp.

Stainless Steels

Welding of High-Alloy Steel Castings, by R. D. Thomas Jr., chairman, WRC Committee.
Structural Stability of Welded Joints Between Dissimilar Metals in High-Temperature Service, by R. W. Emerson, Pittsburgh Piping & Equipment Co.

Thursday Morning, Oct. 18
Educational

Selecting and Training Welding Operators for the Defense Program, by A. N. Kugler, Air Reduction Sales Co.
Metallurgy for the Welding Student, by J. D. Paterson, Cass Technical High School.
Tentative Standards for School Welding Shops, by Carl H. Turnquist, Cass Technical High School.
Welding Instruction in the Public Schools, by A. D. Alt-house, Detroit Public Schools.

Weldability

Arc Welding of Carbon-Molybdenum Steel Pipes, by F. J. Winsor, E. I. du Pont de Nemours & Co.
Residual Stresses Due to Circumferential Welds in Seamless Mild Steel Pipe, by L. J. Privoznik, Standard Oil Co. (Ind.)
Heat Treating Properties of Low-Hydrogen Electrode Weld Metal, by D. C. Smith and W. G. Rinehart, Harnischfeger Corp.
High-Temperature Welded Joints, by R. H. English, National Alloy Steel Co.

Inert-Arc Welding

Inert Gas Shielded Metal Arc Welding of Magnesium, by Paul Klain, Dow Chemical Co.
Aircomatic Welding of Ferrous Metals, by E. DiLiberti, Air Reduction Sales Co.

Metal Transfer in Shielded Inert Gas Metal Arc Welding, by R. T. Breyemeier, Union Carbide and Carbon Research Laboratory.
High-Speed Consumable Electrode Machine Welding for Aircraft, by Bernard Gross and R. A. Smith, Rohr Aircraft Corp.

Thursday Afternoon, Oct. 18
Symposium

Filler Metal Specifications for Inert-Gas and Submerged-Arc Welding
Business Meeting, Board of Directors Meeting

Thursday Evening, Oct. 18
Annual Dinner
Presentation of Awards

Friday Morning, Oct. 19
Inert-Arc Welding

Aircomatic Welding-Refinery Components and Pressure Vessels, by S. Yaczko, United Engineers & Constructors Inc.
Shielded Inert Gas Metal Arc Welding, by H. T. Herbst, Linde Air Products Co.
Performance of High-Strength Aluminum Alloy Weldments, by W. R. Applett and W. S. Pellini, Metallurgy Division, Naval Research Laboratory.
Thoriated Tungsten Electrodes—Their Welding, Characteristics and Applications, by G. J. Gibson and R. O. Seitz, Air Reduction Sales Co.

Metallizing

Fundamentals of the Metallizing Process, by F. J. Keller, Aluminum Research Laboratories.
New Developments on Metallizing During the Past Ten Years, by Sam Tour, Sam Tour and Co.
Typical Applications of Metallizing, by K. B. Smith, Dix Engineering Co.



Institute of Metals Division, AIME

PROGRAM

All Sessions at Detroit-Leland Hotel

Monday, Oct. 15, 9:00 a.m.

Grain Growth and Recrystallization

Grain Structure of Aluminum-Killed Low Carbon Steel, by R. L. Solterand, C. W. Beattie, Armco Steel Corp.
Theory of Grain Boundary Migration Rates, by D. Turnbull, General Electric Co.
Secondary Recrystallization in Copper Wire, by G. Baszi, A. B. Svenska, Metallverken, Sweden.
Cleavage and Polygonization of Molybdenum Single Crystals, by N. K. Chen and R. Maddin, Johns Hopkins.

Monday, Oct. 15, 9:00 a.m.

Alloy Systems—I

Systems Titanium-Molybdenum and Titanium-Columbium, by M. Hansen, H. D. Kessler and D. J. McPherson, Armour Research Foundation, and E. L. Kamen, U. S. Naval Reserve.
Crystal Structure of Ti_3Si , Ti_3Ge , and Ti_3Sn , by P. Pietrokowski and Pol Duwez, California Institute of Technology.
Solidification of Lead-Tin Alloy Droplets, by J. H. Hollomon and D. Turnbull, General Electric Co.
Equilibrium Relations in Magnesium-Aluminum-Manganese Alloys, by R. J. Nelson, Aluminum Co. of America.
Constitution and Precipitation Hardening Properties of Copper-Rich Copper-Tin Beryllium Alloys, by R. A. Cresswell and J. W. Cuthbertson, Tin Research Institute (England)

BUSINESS IN MOTION

To our Colleagues in American Business ...

For several years this space has been used to tell how Revere has collaborated with its customers, to mutual benefit. Now we want to talk about the way our customers can help us, again to mutual benefit. The subject is scrap. This is so important that a goodly number of Revere men, salesmen and others, have been assigned to urge customers to ship back to our mills the scrap generated from our mill products, such as sheet and strip, rod and bar, tube, plate, and so on. Probably few people realize it, but the copper and brass industry obtains about 30% of its metal requirements from scrap. In these days when copper is in such short supply, the importance of adequate supplies of scrap is greater than ever. We need scrap, our industry needs scrap, our country needs it promptly.

Scrap comes from many different sources, and in varying amounts. A company making screw-machine products may find that the finished parts weigh only about 50% as much as the original bar or rod. The turnings are valuable, and should be sold back to the mill. Firms who stamp parts out of strip have been materially helped in many cases by the Revere Technical Advisory Service, which delights in working out specifications as to dimensions in order to minimize the weight of trimmings; nevertheless, such manufacturing operations inevitably produce scrap. Revere needs it. Only by obtaining scrap can Revere, along with the other companies in the copper and brass business, do the utmost possible

in filling orders. You see, scrap helps us help you.

In seeking copper and brass scrap we cannot appeal to the general public, nor, for that matter, to the small businesses, important though they are, which have only a few hundred pounds or so to dispose of at a time. Scrap in small amounts is taken by dealers, who perform a valuable service in collecting and sorting it, and making it available in large quantities to the mills. Revere, which ships large tonnages of mill products to important manufacturers, seeks from them in return the scrap that

is generated, which runs into big figures of segregated or classified scrap, ready to be melted down and processed so that more tons of finished mill products can be provided.

So Revere, in your own interest, urges you to give some extra thought to the matter of scrap. The more you can help us in this respect, the more we can help you. When a Revere salesman calls and inquires about scrap, may we ask you to

give him your cooperation? In fact, we would like to say that it would be in your own interest to give special thought at this time to all kinds of scrap. No matter what materials you buy, the chances are that some portions of them, whether trimmings or rejects, do not find their way into your finished products. Let's all see that everything that can be re-used or re-processed is turned back quickly into the appropriate channels and thus returned to our national sources of supply, for the protection of us all.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices:

230 Park Avenue, New York 17, N. Y.

SEE "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

150TH YEAR OF
SERVICE
TO AMERICA



Monday, Oct. 15, 2:00 p.m.
Seminar—Dislocations in Metals

- Nature of Dislocations, by Frederick Seitz, University of Illinois.
Role of Dislocations in Crystal-Growth and Grain-Boundary Phenomena, by W. T. Read, Bell Telephone Laboratories.

Monday, Oct. 15, 8:00 p.m.
Seminar—Dislocation in Metals

- Theories of Dislocations as Applied to Mechanical Behavior, by Egon Orowan, Massachusetts Institute of Technology.

Tuesday, Oct. 16, 9:00 a.m.
Transformations

- Rapid Tempering of High Speed Steel, by A. E. Powers, General Electric Co., and J. F. Libach, Lehigh University.
Effect of Rate of Cooling on the Alpha-Beta Transformation in Titanium and Titanium-Molybdenum Alloys, by Pol Duwez, California Institute of Technology.
Burst Phenomenon in the Martensitic Transformation, by E. S. Machin and Morris Cohen, Massachusetts Institute of Technology.
Isothermal Formation of Martensite at Sub-zero Temperatures in a High Chromium Steel, by C. S. Das Gupta, University of Notre Dame, and B. S. Lement, Massachusetts Institute of Technology.
Isothermal Transformation and Properties of a Commercial Aluminum Bronze, by A. H. Kasberg, Jr., Westinghouse Electric Corp., and D. J. Mack, University of Wisconsin.

Tuesday, Oct. 16, 9:00 a.m.
Alloy Systems—II

- Crystal Structure of UAL₃, by B. S. Borie, Jr., Oak Ridge National Laboratories.
Intermediate Phases in Ternary Alloy Systems of Transition Elements, by P. A. Beck, University of Notre Dame; Sheldon Rideout and W. D. Manly, Oak Ridge National Laboratories; E. L. Kamen, U. S. Naval Reserve; and B. S. Lament, Massachusetts Institute of Technology.
Intermetallic Compounds in the System Molybdenum-Beryllium, by S. G. Gordon and G. E. Klein, Los Alamos Scientific Laboratory and J. A. McGurty and W. J. Kosshuba, NEPA Project.
Chromium-Nickel Phase Diagram, by S. Bloom and N. J. Grant, Massachusetts Institute of Technology.
Effect of Tungsten or Molybdenum Upon the Alpha-Beta Transformation and Gamma Precipitation in Cobalt-Chromium Alloys, by A. R. Elsea and E. E. Fletcher, Battelle Memorial Institute.

Tuesday, Oct. 16, 2:00 p.m.
Light Metals

- Effects of Pre-Compression on the Behavior of the Aluminum Alloy 24ST, During Cyclic Direct Stressing, by S. I. Liu, Pei-Yank University.
Structure Studies of Plastic Deformation in Aluminum Single Crystals, by N. K. Chen, Johns Hopkins University, and C. H. Mathewson, Yale University.
Effect of Alloying Elements on the Elevated Temperature Plastic Properties of Alpha Solids Solutions of Aluminum, by J. E. Dorn, O. D. Sherby and R. A. Anderson, University of California.
Effect of Alloying Elements on the Electrical Resistivity of Aluminum Alloys, by A. T. Robinson and J. E. Dorn, University of California.

Tuesday, Oct. 16, 2:00 p.m.
Creep

- Fundamental Effects of Cold Working on the Creep Resistance of an Austenitic Alloy, by D. N. Frey and J. W. Freeman, University of Michigan.
Creep Characteristics of Some Platinum Metals at 1382° F, by Ralph H. Atkinson, D. R. Furman, International Nickel Co.

Creep Behavior of Zinc as Modified by Copper in the Surface Layer, by Earl R. Parker and M. R. Pickus, University of California.

Creep and Stress Rupture Behavior of Aluminum as a Function of Purity, by Italo S. Servi and N. J. Grant, Massachusetts Institute of Technology.

Tuesday, Oct. 16, 7:00 p.m.
Institute of Metals Division Fall Dinner

Wednesday, Oct. 17, 2:00 p.m.

High Temperature Oxidation of Metals and Alloys

- Oxidation of Titanium, by M. H. Davies and C. E. Birchenall, Carnegie Institute of Technology.
Thermal Stability of the Chromium, Iron and Tungsten Borides in Steaming Ammonia and the Existence of a New Tungsten Nitride, by Roland Kiessling and Y. H. Liu, University of Uppsala, Sweden.
High Temperature Oxidation of Copper-Palladium and Copper-Platinum Alloys, by D. E. Thomas, Westinghouse Electric Corp.
Mechanism and Kinetics of the Scaling of Iron, by M. H. Davies, M. Y. Simnad, and C. E. Birchenall, Carnegie Institute of Technology.
Thermal Variation of Young's Modulus in Some Fe-Ni-Mo Alloys, by Morris E. Fine and W. C. Ellis, Bell Telephone Laboratories.

Wednesday, Oct. 17, 2:30 p.m.

Powder Metallurgy

- Role of Gases in the Production of High Density Powder Compacts, by Donald Warren and J. F. Libsch, Lehigh University.
Solubility Relationships in Some of the Ternary Systems of Refractory Mono-Carbides, by John T. Norton, Massachusetts Institute of Technology and A. L. Mowry, Kaiser Aluminum and Chemical Co.



Society for Non-Destructive Testing

PROGRAM

All Sessions at Hotel Detroit

Monday, Oct. 15, 9:30 a.m.

- Technical Chairman: John Smack, Sperry Products Inc.
Sonic Comparator Used on Grinding Wheels, by R. G. Rowe, Carborundum Co.
Ultrasonic Testing of Railroad Rails, by Peter K. Block, Branson Instruments Inc.
Curved Crystal Developments, by C. R. Betz, Magnaflux Corp.

Monday, Oct. 15, 2:00 p.m.

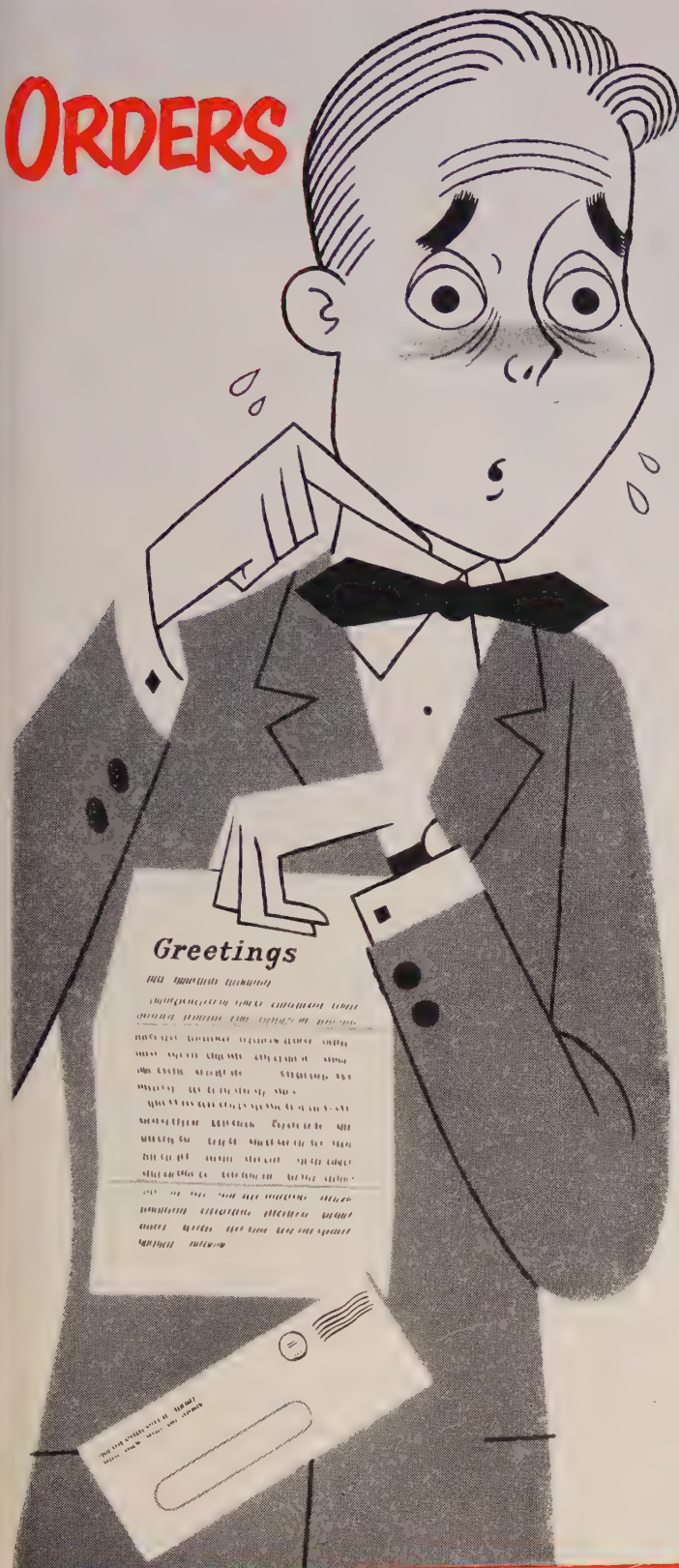
- Technical Chairman: R. C. McMaster, Battelle Memorial Institute.
Triboelectric Effect and Its Application to Sorting Metals, by Anthony Doschek, Doschek Associates.
Testing of Ceramics, by Harry Staats, Magnaflux Corp.
Internal Microstrains and Deformation and Failure of Metals, by P. E. Cavanaugh, L. J. Dijkstra and U. Martius, Ontario Research Foundation and B. Chalmers, University of Toronto.
Radiographic Porosity Standards Versus Tensile Properties of Light Alloy Castings, by I. S. Feinberg and J. J. Pierce, U. S. Naval Ordnance Laboratory.

Tuesday, Oct. 16, 9:30 a.m.

- Technical Chairman: Hamilton Migel, Magnaflux Corp.
Problems Concerning Inspection with Penetrants, by Arch Walters and R. C. McMaster, Battelle Memorial Institute.

ORDERS

from Uncle Sam?

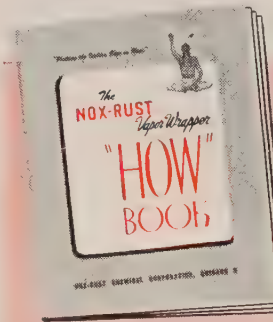


SEE NOX-RUST FOR YOUR
RUST PREVENTIVES...

To fight the battle against rust, Uncle Sam has drafted rigid requirements for rust preventives that are used in packaging metal parts and products. To find the proper product conforming with these Federal Specifications, call on NOX-RUST . . . the world's largest manufacturers of rust preventive products. NOX-RUST has the answer for you . . . all prepared in a handy chart that shows Federal Specifications, uses, applications and specific product recommendations. For your free copy of this chart, just use the handy coupon below.

NEED A RUST PREVENTIVE TAILORED TO YOUR NEED?

Just call NOX-RUST. Chances are an existing product can fill the bill for you. Or, NOX-RUST can build a product around your problem, as they already have done for many major corporations. For complete information, call or write NOX-RUST today.



STOP RUST WITHOUT
OIL OR GREASE

Here's a NEW way to package parts and machines without oil or grease coatings. NOX-RUST's new Vapor-Wrapper delivers your parts "factory fresh"—sparkling clean—ready for immediate assembly or use.

Send for the "HOW" book that shows case histories of how others have eliminated slushing and de-greasing problems with Vapor-Wrapper. It's yours FREE . . . from NOX-RUST—Headquarters for all Rust Preventive Products.

NOX-RUST

CHEMICAL CORPORATION

RUST PREVENTIVE DIVISION

2429 SOUTH HALSTED STREET, CHICAGO 8, ILLINOIS

BALTIMORE • PHILADELPHIA • DETROIT • SAN FRANCISCO

Nox-Rust Chemical Corporation
2421 S. Halsted St., Chicago 8, Ill.

Please send information on (check one or both)

☐ Rust Preventive Chart ☐ Vapor-Wrapper "How" Book

NAME _____

TITLE _____

COMPANY NAME _____

ADDRESS _____

CITY _____ STATE _____

Tiny holes? Easy!

Accurate holes? Easy!

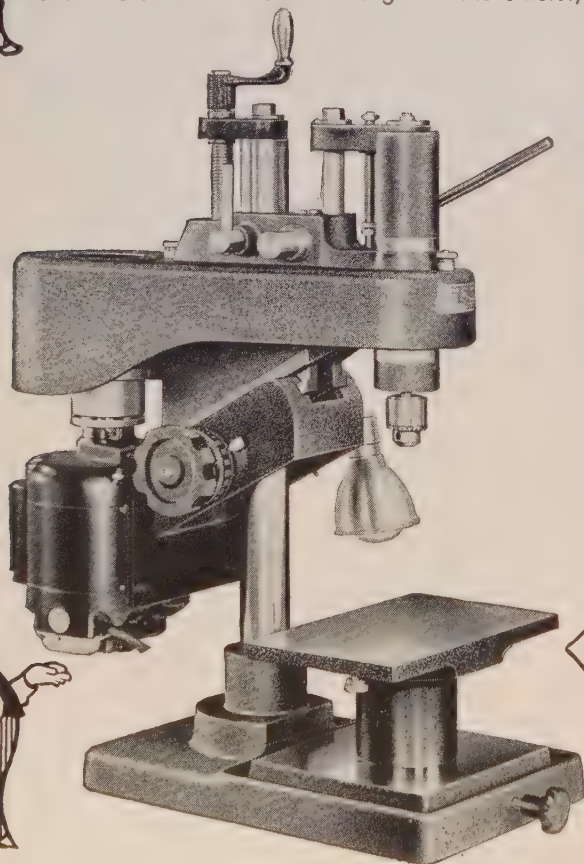
Holes on production schedules? Easy!

Tiny, accurate holes on production schedules? . . . WOW!

Hamilton Drilling Machines can do it!
And withdraw the drill undamaged
from hole after hole after hole!

LEARN HOW!

Write for the series of Hamilton Drilling
Machine Bulletins and Price Lists.
(There is also a companion Tapping Machine.
Shall we send that bulletin along with the others?)



Shown here is the Hamilton
Varimatic, Super Sensitive, Vari-
able Speed, Small Hole Drilling
Machine, one of four models,

each particularly adapted to the
work for which intended, all
equally precise.



Photoelectric Scanning of Magnetic
Particle Ind.cations, by S. A. Wenk
and Donald Cooley, Battelle Me-
morial Institute.
Multi-Directional Magnetic Particle
Inspection, by R. A. Peterson, Mag-
naflux Corp.
Theoretical and Practical Sensitivity
Limits in Fluoroscopy, by D. T.
O'Connor and D. Polansky, U. S.
Naval Ordnance Laboratory.

Tuesday, Oct. 16, 2:00 p.m.

Technical Chairman: Noah Kahn,
New York Naval Shipyard.
T-V Pickup of X-Ray Images, by
Russell Morgan, John Hopkins Hos-
pital.
T-V Pickup of X-Ray Images with
Pin Point Apertures, by Robert J.
Moon, University of Chicago.
Selection of X-Ray Detectors for Au-
tomatic X-Ray Inspection Applica-
tions, by J. E. Jacobs and A. L.
Pace, General Electric X-Ray Corp.
Intensifying Brightness of Fluoro-
scopic Images, by Walter S. Lusby,
Westinghouse Electric Corp.

Wednesday, Oct. 17, 9:30 a.m.

Symposium on Ordnance Materiel Testing

Chairman: William McKenzie, Naval
Gun Factory.
Small Arms Parts Inspection, by H. P.
Langston, Springfield Armory.
Tank Parts Inspection, by J. K. Mc-
Dowell, Rock Island Arsenal.
Gun Mount Inspection, by C. M.
Underwood, Northern Ordnance Inc.

Wednesday, Oct. 17, 2:00 p.m.

Symposium on Jet Engine Part Inspection

Chairman: J. Manuele, Westinghouse
Electric Corp.
Ultrasonic Testing, by George Sippel,
Allison Division, General Motors
Corp.
Fluorescent Penetrant Testing, by
William Buckman, Thompson Prod-
ucts Inc.
Radiography Testing, by James H.
Bly, Pratt & Whitney Division,
Niles-Bement-Pond Co.
Magnetic Particle Inspection, by A.
Robinson, General Electric Co.

Thursday, Oct. 18, 9:30 a.m.

Technical Chairman: Gerold Tenney,
Los Alamos Scientific Laboratory.
The Metallurgist's Role in Interpre-
tation of Non-Destructive Tests, by
Scott Henry, A. O. Smith Corp.
Non-Destructive Testing Personnel
Problems, by Leslie Ball and T. K.
Chatham, Naval Ordnance Labora-
tory.
Picker Poloroid One-Minute Radio-
graphy, by J. A. Reynolds, Picker
X-Ray Co.

Thursday, Oct. 18, 2:00 p.m.

Chairman: W. E. Thomas, Magnaflux
Corp.
Honor Lecture, by Donald M. Mc-
Cutcheon, Ford Motor Co.

Annual Business Meeting

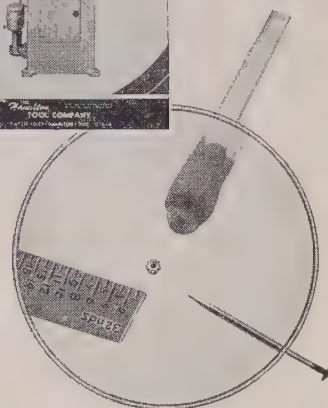
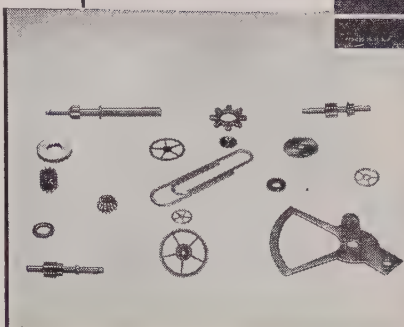
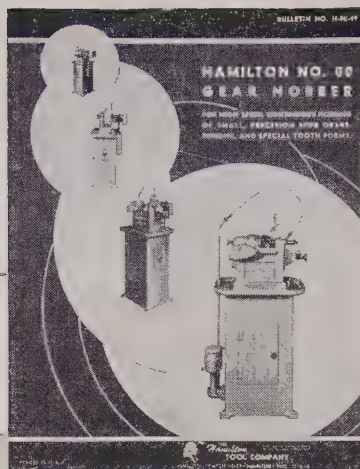
EXHIBITORS

At the Metal Show

Booth No.

A & B Centerless Grinding Co., Detroit	A115
A. B. C. Die Casting Machine Co., Chicago	G127
Acetogen Gas Co., Detroit	A215
Acme Mfg. Co., Detroit	D103
Acme Steel Co., Chicago	C221
Acme Tool Co., New York	A205
Adamas Carbide Corp., Harrison, N. J.	H218
Air-Flo Compressor Co., Akron	H219
Ajax Electric Co. Inc., Philadelphia	F421
Ajusto Equipment Co., Toledo, O.	H147
Allegheny Ludlum Steel Corp., Pittsburgh	G459
Allied Products Corp., Detroit	F302
Allison Co., Bridgeport, Conn.	H431
Alloy Engineering & Casting Co. Inc., Champaign, Ill.	B107
Alox Corp., Niagara Falls, N. Y.	C112
Alvey-Ferguson Co., Cincinnati	H502
American Brake Shoe Co., New York	F339
American Chain & Cable Co. Inc., Bridgeport, Conn.	A342
American Cyanamid Co., New York	G452
American Gas Association, New York	G160
American Gas Furnace Co., Elizabeth B, N. J.	G154
American Machine & Metals Inc., East Moline, Ill.	B246
American Metal Market, New York	C110
American Metals Co., Ltd., New York	G459
American Optical Co., Buffalo	B128
American Platinum Works, Newark, N. J.	G240
American Pullmax Co. Inc., Chicago	A249
American Silver Co. Inc., Flushing, N. Y.	D129
American Society of Tool Engineers, Detroit	H245
American Wheelabrator & Equipment Corp., Mishawaka, Ind.	F439
Ames Precision Machine Works, Waltham, Mass.	A152
Amplex Mfg. Co., Detroit	G416
Anchor Drawn Steel Co., Latrobe, Pa.	D345
Anderson Bros. Mfg. Co., Rockford, Ill.	H351
Anderson Oil Co., F. E., Portland, Conn.	F255
Angier Corp., Framingham, Mass.	G139
Applied Research Laboratories, Glendale, Calif.	G121
Arcos Corp., Philadelphia	F457
Aronson Machine Co., Arcade, N. Y.	C127
Ashdee Products Inc., Homewood, Ill.	G361
Ashworth Bros. Inc., Worcester, Mass.	D140
Atlas Press Co., Kalamazoo, Mich.	A241
Aurora Metal Co., Aurora, Ill.	C215
Austen Laboratories Inc., New York	B142
Avon Tube Division, Rochester, Mich.	C237
Babcock & Wilcox Tube Co., New York	F314
Baird Associates Inc., Cambridge, Mass.	H427
Bakelite Division, New York	F322
Baker & Co., Inc., Newark, N. J.	A363
Baldwin-Lima-Hamilton Corp., Philadelphia	D311
Banner Mfg. Co., Milwaukee	H302
Bausch & Lomb Optical Co., Rochester, N. Y.	B102
Bell & Gossett Co., Morton Grove, Ill.	A308
Bernard Welding Equipment Co., Chicago	H220

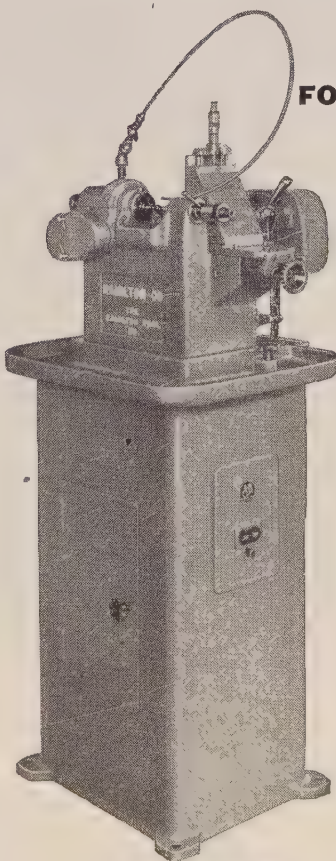
(Please turn to Page 181)



**THE MOST NEWS
and
THE BEST NEWS**

ABOUT SMALL, PRECISION SPUR GEAR HOBGING

**IS YOURS
FOR A MINUTE AND A PENNY**



Does your job involve small, precision spur gears? Would you like to produce them fast?

Whether your work calls for long production runs or frequent set-ups, you need to know about the Hamilton No. 00 Precision Spur Gear Hobber. Spend a minute now to send your request for a copy of our Bulletin No. H-00-49. Acquaint yourself with this efficient tool, and be ready for the challenge ahead.

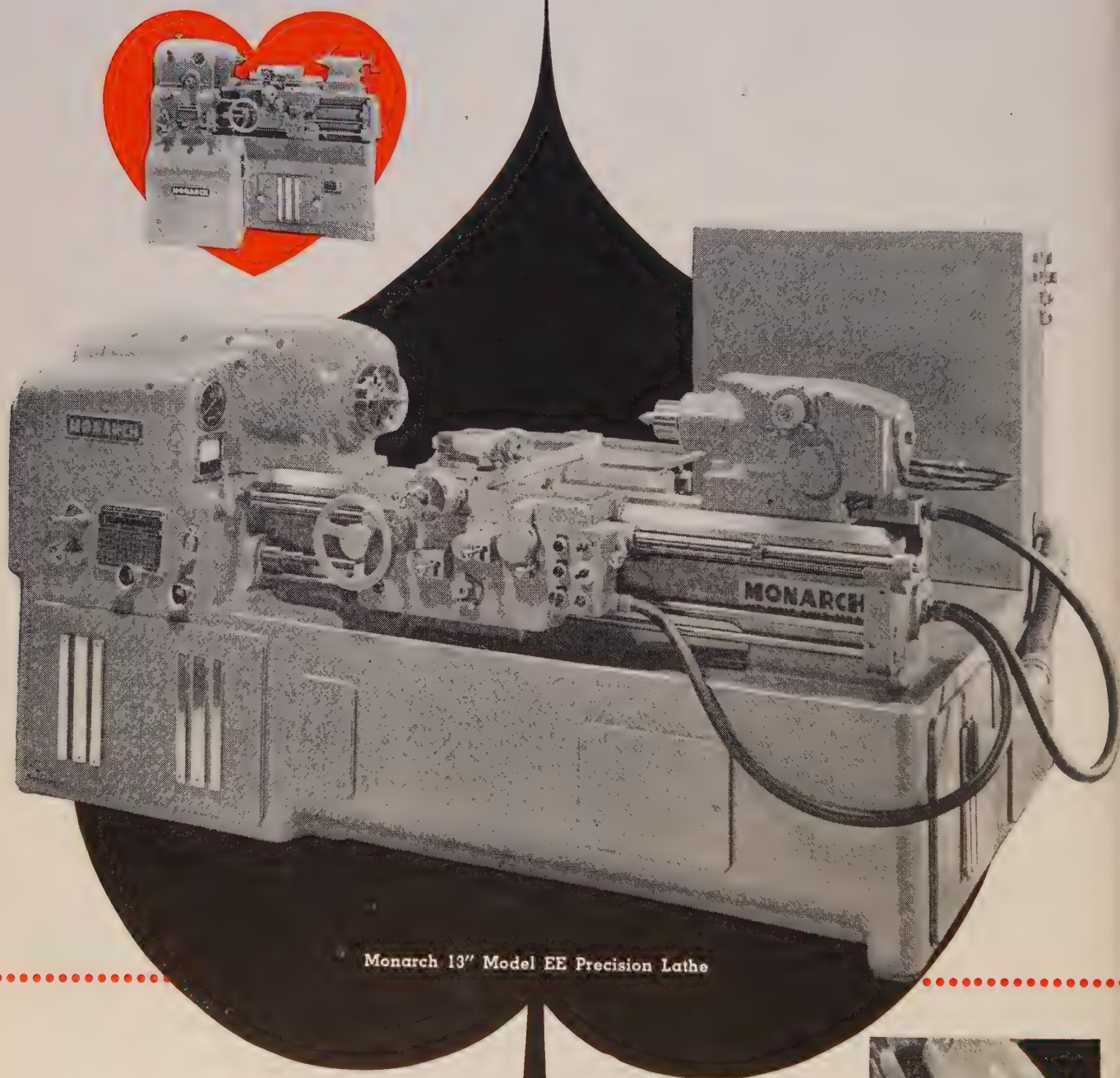
NOTE: If you are interested in helical gears, worm gears, bevel gears, and crown gears, as well as spur gears, ask for Bulletin H 1-49. No obligation.



You're acquainted with this sweetheart—the 10" Monarch Model EE—one of the most popular lathes ever built. Over 6,000 in use.

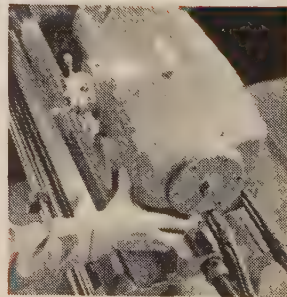
Now—Monarch introduces the EE's big brother—the larger lathe you have been asking for. Not simply a larger EE, this new lathe embodies features never before perfected and combined in any lathe.

This One New



FOR A GOOD TURN FASTER . . .

TURN TO MONARCH



The mere touch of this button unclamps the 385 pound tailstock—a slight push or pull moves it along the bed while release of the button reclamps it. Its $3\frac{3}{4}$ " diameter spindle is indicative of the strength built into the entire machine.

Ace Takes **EVERY** Trick!

Toolmaker's Lathe! Manufacturing Lathe! The New

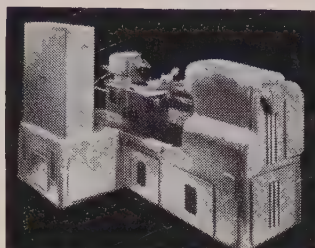
MONARCH 13" MODEL EE PRECISION LATHE is a Standout in Both Roles

Here's the first and only truly dual purpose lathe ever made!

In the toolroom, it provides toolmaker's precision—plus a new high standard in amount of work output. On manufacturing operations, it slashes turning time unbelievably, with no sacrifice of its basic accuracy. For more profitable performance in *each* use, and unequalled performance in *both*, the Monarch 13" Model EE is your answer for practically every type of turning.

Everything about this machine represents fresh engineering thinking. Consider these features.

- 1. Built-in constant surface cutting speed.** Becomes operative at the flick of a switch. With it, the operator is *always* using the most efficient cutting speed. Finish and accuracy are improved; turning time on some facing operations can be reduced up to 50%.
- 2. All-hydraulic tailstock.** Nothing like it on any other lathe. Hydraulic positioning and clamping permits almost effortless repositioning of this 385 lb. unit in a matter of a few seconds. Hydraulic feed and traverse to the spindle. Drilling and reaming operations performed with a quickness and ease never thought possible heretofore.
- 3. Infinitely variable speeds up to 2000 R.P.M.** In four overlapping ranges and provided by a 15 H.P. variable speed motor. The number of speeds is



limitless—the one which is ideal for the job at hand can always be secured. High speed range direct to spindle through multiple "V" belts for the ultimate in high finish performance.

- 4. Electrical speed change.** It's practically instantaneous. The turn of a

knob gives every speed within a given range; change-over from one speed range to another is automatic immediately upon resetting of selector knob. No calculating of lever settings by reference to an index plate. Nothing could be as simple, as quick, as positive.

- 5. Four-way rapid tool traverse.** Cross traverse in and out and longitudinal traverse right or left provided by individual motor drive. Tool repositioning couldn't be made easier or faster.

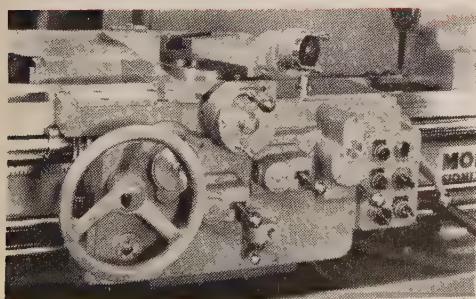
- 6. Flexibility unlimited.** It's difficult to find a lathe job which the 13" Model EE cannot handle. There are 66 thread and feed changes. Regular equipment includes a ball bearing taper attachment, direct length reading dial, thread chasing stop, apron controlled leadscrew reverse with automatic stop in both directions, steady rest and follow rest.

Surely, you'll want to know more about this lathe whose features place it in a class all its own. The complete story is in booklet No. 502. Just fill in the coupon and we'll send it gladly.

Monarch



TURNING MACHINES



Complete control of the machine is concentrated at the apron which is always convenient to the operator. Besides the usual controls found on conventional lathe aprons, this one is provided with complete control of the four-way rapid tool traverse, the built-in constant surface cutting speed and full electrical control of the speed change and the work drive.

THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO

Gentlemen:

Please send me without obligation your Booklet No. 502 giving full information and description of the Monarch 13" Model EE Precision Lathe.

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____

CALCIUM CYANAMID . . .

A Source of Nitrogen in Steel

OPERATING experience has shown that nitrogen in low-carbon, semikilled, rimmed and capped grades of steel promotes aging or precipitation hardening, affects grain sensitivity, and increases hardness and tensile strength. Considerable work has been done on the addition of nitrogen to high chromium content alloy steels including several stainless grades, as well as several low-carbon resulphurized steels. Nitrogen additions also increase the hardness and corrosion resistance of cutlery steels and other martensitic stainless steels without detrimentally affecting corrosion resistance.

Calcium cyanamid was first used by the steel industry to make nitrogen bearing alloy steels.⁴ It was found that small additions of cyanamid (2 to 3 pounds per ton of steel) could produce grain refinement and materially increase the strength, hardness and wear resistance of these steels. It is generally conceded that the nitrogen content of cyanamid causes these phenomena. Large quantities of calcium cyanamid are used today for this purpose, according to American Cyanamid Co.

Tin plate producers are the largest users of cyanamid as a source of nitrogen for steel. Almost without exception, tin mills have found cyanamid useful to increase temper hardness. Moreover, this increase in hardness can be obtained with a minimum of cold rolling, sometimes 50 per cent less than that necessary for lower nitrogen strip.⁷

Higher nitrogen content has proved highly successful for several hot-rolled applications such as drum body and end stock.^{4,6,7} Such stock is reported to be less susceptible to fluting, and will form and weld easily. Both hot and cold rolled strip and sheet of this type can be used for containers, bands, signs, stoves, wrapper sheets for refrigerators, etc.

Nitrogen bearing steels can also be used for moderate drawing applications where stiffness and buckling resistance are of importance.⁷

Calcium cyanamid is also being used to increase the nitrogen content of resulphurized and/or rephosphorized low-carbon capped or rimmed steels.^{4,6,8} Considerable improvement in machinability can be obtained.

In some of the applications mentioned herein, investigators have found that corrosion resistance has been simultaneously increased.^{1,2,3,4} For example, nitrogen bearing tin cans are believed to be less susceptible to corrosion caused by citrous acids when pin holes expose the base iron. Similarly, reports have been received indicating that nitrogen bearing

steels are better suited for the corrosion problems encountered with underground culverts.

At least one investigator believes calcium cyanamid might be useful as a secondary slag reducing agent. Another group reports unusually clean ingot surfaces can be obtained with nitrogen bearing heats.

It has been reported that calcium cyanamid can reduce the sulphur and oxygen content of certain grades of steel.^{1,3,4,5} It is believed that the decomposition products of cyanamid react with these elements to form compounds which are carried away from the steel by ebullition or agitation. An increase in the recovery of manganese has also been noted.

Calcium cyanamid normally is used as a ladle or runner addition. Operating data collected from numerous sources show that nitrogen recoveries can range from 10 to 30 per cent, the average recovery being about 20 per cent. Using this average figure, approximately 0.45-pound of cyanamid should be added to a ton of steel to increase the nitrogen content 0.001 per cent. Recoveries reported by individual operators are fairly consistent. The variation noted above is apparently the result of different techniques, operating conditions, temperatures, composition of heats, etc.


Open-hearth and electric furnace nitrogen recoveries are approximately the same, despite the theory that electric furnace recoveries should be considerably better.

In open-hearth practice, most operators make the cyanamid additions when the ladle is partially filled. Additions to the ladle before tapping usually give lower nitrogen recoveries. Recent reports have indicated that highest recovery can be obtained through runner additions. Electric furnace additions are usually made in the furnace along with the other standard additions.

A typical analysis of calcium cyanamid is as follows:

	%	Equivalent—	
		Nitrogen, %	Carbon, %
Calcium cyanamid	69.46	24.3	10.40
Calcium carbide	0.65		0.24
Calcium sulphide	1.35		
Calcium fluoride	0.98		
Calcium oxide	12.72		
Magnesium oxide	0.10		
Carbon	12.30		
Silicon	0.86		12.30
Moisture	0.15		
Undetermined	1.43		
Total	100.00	24.3	22.94

The decomposition temperature of calcium cyanamid is approximately 2450° F, which is much higher than any of the other high nitrogen bearing



Which comes first—
STEEL or OIL?

STEEL and oil have become as closely related as the chicken and the egg. Any sizable increase in steel production calls for a like increase in oil producing and refining capacity. More steel means more machines, ships, locomotives, trucks, planes and a myriad of other steel products that need fuels and lubricants. And that will take more steel to drill wells and to build pipe lines and refineries.

New steel plants and refineries are both "first" at McKee—and both in a hurry. McKee maintains separate divisions for iron and steel plant and petroleum refinery design, engineering and construction. The combined technical knowledge and experience of these two divisions are particularly advantageous to McKee clients in the present expansion program.

**DESIGN, ENGINEERING AND CONSTRUCTION FOR THE
IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES**

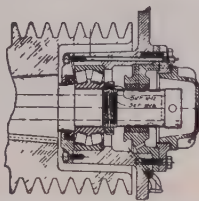
McKee
Engineering

Arthur G. McKee & Company • Established 1905

Headquarters: McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio; *New York:* 30 Rockefeller Plaza, New York 20, N. Y. *Tulsa:* 2803 West 40th Street, Tulsa 7, Oklahoma. *England:* The Iron and Steel Division of Arthur G. McKee & Company, is represented by Head, Wrightson & Co., Ltd.

GLOBE ROTO-CUT meat cutters are the standard of the Packing Industry. They produce better meat products at higher speed.

The Ball Bearing and The Spherical Roller Bearing on the cutter shaft of the GLOBE ROTO-CUT machine.



The
Globe Company
says:

**THIS LUBRICANT INCREASED
BEARING LIFE FROM
2 WEEKS TO 2 YEARS**

"After we had quite a few of our large high speed ROTO-CUT meat cutting machines in actual production operation, the ball and spherical roller bearings on the cutter shaft gave us serious trouble. Some bearings did not last even two weeks.

"In an effort to correct the difficulty, we contacted a number of the large lubricant manufacturers. We tried all the lubricants their engineers recommended without the slightest success. We checked with the manufacturers of the bearings who assured us that the bearings were not overloaded. The trouble was the condition that prevails throughout the meat packing industry, animal acids and moisture, a

combination most harmful to ball and roller bearings.

"Then, Ball Bearing LUBRIPLATE was called to our attention. The results we obtained from its use were most gratifying and amazing. We have had these ROTO-CUT machines lubricated with Ball Bearing LUBRIPLATE in continuous operation, twenty-four hours a day, three hundred days a year for over two years without a single bearing replacement. We now use LUBRIPLATE for factory lubrication and recommend it to our customers for use on practically all the equipment we manufacture."

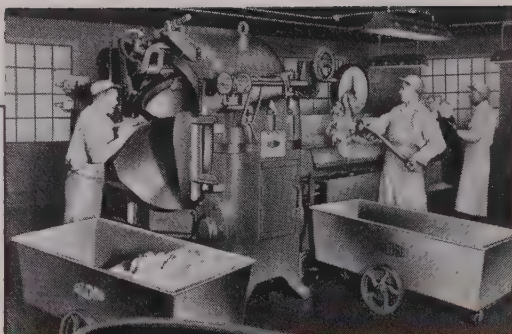
THE GLOBE COMPANY
Frank J. Bilek (Chief Engineer)

YES, LUBRIPLATE LUBRICANTS ARE DIFFERENT! They reduce friction, wear and power consumption . . . prevent rust and corrosion and last longer than ordinary lubricants. LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases. There is a LUBRIPLATE product best for your every lubrication need. Write for case histories of the use of LUBRIPLATE in your industry.

LUBRIPLATE DIVISION • Fiske Brothers Refining Company
Newark 5, New Jersey • Toledo 5, Ohio

DEALERS EVERYWHERE • SEE YOUR CLASSIFIED TELEPHONE BOOK

LUBRIPLATE the Modern Lubricant



compounds. Cyanamid is not hazardous to use. The decomposition products of cyanamid at 2500 to 3000° F are nitrogen, calcium oxide, and carbon dioxide. No hydrocyanic acid is formed.

Calcium cyanamid is available in granular form. The latter was developed specifically for the steel industry and is designated as 6-16 Special Cyanamid. It is relatively free of dust with 100 per cent passing through a 6-mesh screen and 90 per cent retained on a 16-mesh screen.

This special cyanamid is now available in paper bags containing approximately 25 pounds each. For protection during shipment and subsequent storage seven bags are, in turn, packed in a steel drum. This package was developed with the cooperation of several large mills to give them a package which could be handled easily without repacking.

BIBLIOGRAPHY

1. Smith and Motok, U.S. Patent 2,121,005 (1938) (To Republic Steel Corp.)
2. Smith and Motok, U.S. Patent 2,121,056 (1938) (To Republic Steel Corp.)
3. Smith and Motok, U.S. Patent 2,121,057 (1938) (To Republic Steel Corp.)
4. Smith and Motok, U.S. Patent 2,255,016 (1941) (To Republic Steel Corp.)
5. U.S. Patent 1,087,900 (1914)
6. "Steels for Elevated Temperature Service", United States Steel Corp. p. 21.
7. Faddis, Open Hearth Proceedings, Vol. 32, 1949, p. 260.
8. Feigenbaum and Enzian, "Nitrogen in Steel" Iron Age, June 30, 1949, pp. 52-54.

New Alloying Process Developed

Magnesium alloys can be formed by a metallic-powder compressing process rather than by the conventional process of melting magnesium together with other metals according to an Air Force report. The new alloying process consists of mixing atomized magnesium powder with powder of the alloying metals and extruding the powder mixture.

According to this report, the powder-extrusion process results in many alloys having higher strength than alloys of the same composition prepared by extrusion of billets. Powder extrusion is also said to make possible new alloy compositions not obtainable by the melting and casting process, and these new compositions are said to provide alloys of greater strength, improved corrosion resistance and better fabrication characteristics.

PB 104 431, "Properties of Magnesium Alloys Fabricated from Atomized Powder", prepared by Dow Chemical Co. for the Air Force, 445 pages including tables and photographs, sells for \$56.25 in photostat and \$9.00 in microfilm form. Orders should be addressed to the Library of Congress Photoduplication Service, Publication Board Project, Washington 25, D. C. Enclose check or money order payable to the Librarian of Congress.

Who Has the World's Metals

(Continued from Page 124)

becomes the first problem tackled whenever an emergency arises. We have it now in the limitation orders on production of less essential products, and in the allocation of materials to products most urgently needed.

Leaner alloys offer a partial answer. More work is done in the substitution of carbon steels in applications for which alloys formerly were considered necessary. Boron steels hold promise of doing jobs where steels alloyed with more critical elements formerly were required.

Much work looking for practical substitutes for the scarce metals is underway; much more will have to be done before we can support a high-standard peacetime economy alongside a vast war economy. The complete answer to this problem is not yet in sight.

The situation in the more important metals is briefly described in the following:

IRON ORE

Foresight Paying Off

ALTHOUGH iron ore is one of the most common minerals, only two nations of the world have adequate reserves under their control to develop and expand their steel industries to support their positions in the world. They are the United States and Russia. For this reason, they may be rivals for world power for generations to come.

In point of development, Russia is not yet comparable with this country. We have a three-to-one advantage in steelmaking capacity and a similar advantage in iron ore production.

Who Has the Most?—In actual reserves, the United States has more ore and better ore than does Russia. John W. Gruner of the University of Minnesota estimates the reserves available to the United States, including Labrador, Venezuela and other South American countries, exceeds 8 billion tons. Iron content generally is better than 50 per cent.

Russia's actual reserves are estimated at 6 billion tons and the ore generally has a lower iron content than that available to the U. S.

The estimates include neither the taconite of the Mesabi range nor the



When the World Needs a Lift

UNIT 357 on "earth moving" job, lifting globe into position at Midwest Fair exhibit.

It Picks a UNIT to do the Job!

Yes . . . it's really amazing what you can do with a UNIT Crane or Excavator. Take a UNIT 357 Mobile Crane, for example. It travels anywhere! Any time! Powered by ONE engine . . . controlled and operated by ONE man. Compact, it has light-truck mobility — the smoothest operating and easiest handling crane made. Works efficiently even in small yards where space is limited. FULL VISION CAB gives operator complete visibility in all directions.

UNIT 357 is self-propelled . . . mounted on six pneumatic tires . . . duals on the rear . . . singles on the front. Balanced weight distribution keeps entire undercarriage on ground while working. Dimensions meet all highway requirements. Get the complete UNIT 357 story. Write for bulletin.



CONVERTIBLE TO ALL ATTACHMENTS



Rapid conversion, from one attachment or boom to another, is one of the many important UNIT 357 features. If the material handling operations in your plant call for magnet, crane, or clamshell, the UNIT 357 is the logical, and economical, answer to your problem. There is no limit to UNIT 357 versatility!

UNIT CRANE AND SHOVEL CORP.

6521 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

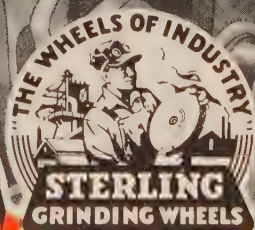
UNIT



SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • TRENCHERS • MAGNETS

A 5696-2/3A

**FOR FAST STOCK REMOVAL
USE STERLING**



Plus VALUE
ABRASIVE PRODUCTS
FOR
• BETTER GRINDING
• FASTER GRINDING
• LOW COST GRINDING

THE STERLING GRINDING

ACCURATE SIZE, SUPERIOR FINISH, CRANKSHAFT WHEELS

Tested on all Types of Crankshaft Jobs, Sterling's
"Wheels of Industry" Provide Unusual Economy
and Longer Wheel Life

Crankshaft grinding is a very exacting operation. No other type of grinding imposes such harsh demands on grinding wheels. In the roughing operation, great amounts of stock have to be removed. Yet, in the finishing, very close limits are the rule. The crankshaft grinding wheel must stand up under these punishing operations, hold its corners and give long, money-making service.

Sterling Crankshaft Grinding Wheels, built to the special demands of your particular jobs, have a tailor-made, specification-spread that makes them applicable for the solution of any of your crankshaft grinding problems. Backed by the most intensive research and development program, Sterling's "Wheels of Industry" are offering extra value that is worthy of the investigation of those interested in obtaining the best.

Because of the intense study behind these superior wheels by our technicians and engineers, you can demand unusually fine finishes, far beyond what is ordinarily obtainable from crankshaft grinding wheels. To obtain the finest grinding results is a simple matter--write us today and our engineers will gladly arrange a wheel test on your machines to prove the high quality of the wheels that are best--Sterling's!

Best in the Test--That's STERLING!

In a recent test of a 42 x 1.465 x 12 Sterling "Wheel of Industry," this abrasive unit was very satisfactory on 80 lb. crankshafts, stock removal being .055 on O. D. and .070 on the sidewall. This wheel cut freely and held corners exceptionally well.

It was much better than the competing wheel and was designated by the customer as being the best wheel ever tested in this well known plant. Similar results may be obtained on your crankshaft grinding jobs with Sterling Grinding Wheels. Ask for a test today!

Write for These STERLING Research and Development Folders . . .

Anyone interested in better grinding will appreciate the important data to be found in this literature. The popular "Art and Science of Grinding," just off the press, is included in this group of books and folders. Together, they form a most complete series to keep in a handy file for ready reference. When quick decisions are necessary on various types of grinding jobs, you will welcome the information included in these folders. Ask for your copies today--no obligations!



WHEEL DIVISION  TIFFIN OHIO

AMAZING ANGIER PAPER GIVES OFF VAPOR THAT **STOPS RUST**

Think of your savings! Here's an exporter who has *scrapped slushing* and all the mess that goes with it! When grease and oil were smeared over these intricate machines, packaging time was over 9 man-hours. Now only 1½ hours does it!



The answer is . . . Angier VPI* Wrap. This chemically coated paper gives off a vapor that *prevents rust!* If you ship or store metal products or parts, this clean and *proven* new way to stop rust is a cinch! Your customers, too, will be all for it because there's no "cleaning" to do. Get the facts now in "Applications of Angier VPI Wrap." It's FREE!

*Reg. U. S. Pat. Off.
Vapor rust preventive



Framingham 8,
Massachusetts

Building "G"
Booth Number **G-139**

Visit Angier at the Show!

**2
GREAT, NEW
PORTER
CUTTERS**

for cutting extremely hard materials, including stainless steel

**PORTER
CARBIDE EDGED
CUTTER**

Another important Porter development for cutting extra hard materials, such as stainless steel rods, wires, pins, etc. Tough carbide edges are firmly brazed to cutting jaws. Stands up under the toughest usage! Pays for itself many times over. #3CE cuts up to 3/16" dia. #4CE cuts up to 1/8" dia.

for cutting hot steel bars, rods, wires, etc.

**PORTER
HOT METAL CUTTER**

An ideal tool for steel mills and fabricating plants. Made of special hot work steel and special heat-treated jaws, for long life under continuous heavy duty with no loss to cutting edge temper.

#3HW cuts up to 3/16" dia. #4HW cuts up to 1/8" dia. Order through your industrial supply house!

H. K. PORTER, INC., 74 Foley Street, Somerville 43, Mass.



probable magnetic iron formations in the Kursk district of Russia.

Production—The United States last year produced just under 100 million gross tons of iron ore, nearly three times the output of Russia. Third largest producer was France with about 30 million tons. Sweden, United Kingdom and Germany followed in that order. No other country produced as much as 4 million tons during the year.

United States iron ore and steel interests have projects underway which will increase this country's production steadily to 132.5 million tons by 1955 to accommodate the vast expansion in steelmaking capacity.

Much of the additional ore will come from newly developed deposits in Labrador, Venezuela and Liberia. Development work in other Western Hemisphere countries is continuing. Brazil may become an important contributor to our ore supply in the years ahead.

How Much Domestic Ore—We have used more than 2650 million tons of Lake Superior ores. About 60 per cent of these came from the Mesabi range alone.

Much has been written on the approaching exhaustion of these rich deposits and there is little doubt that the Mesabi in the next decade or so will lose much of its importance as a source for rich ore. But it will continue to be our major source of supply for at least 10 years.

University of Minnesota officials estimate the probable reserves in the Lake Superior district (United States) as follows (in million of tons):

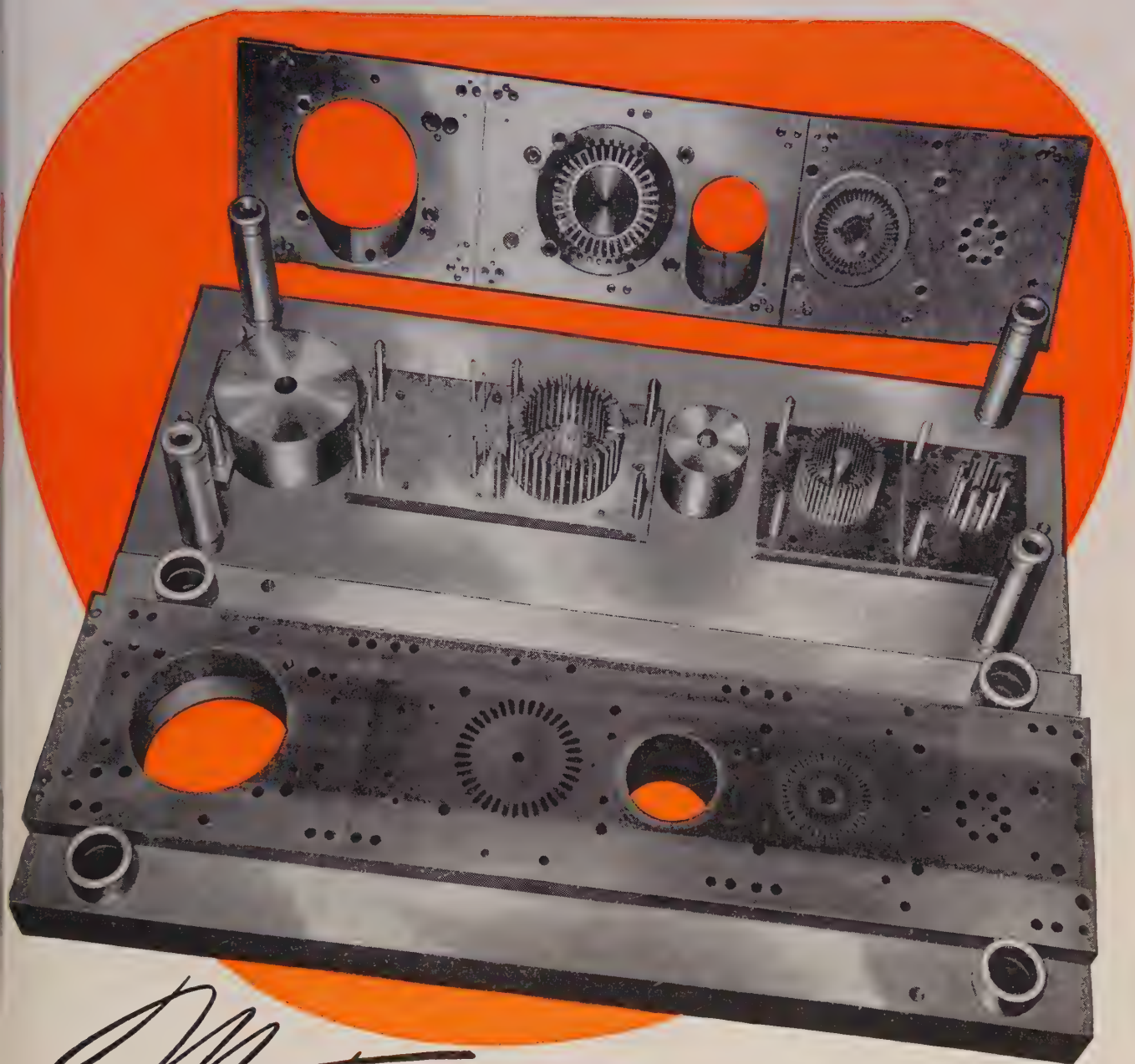
Mesabi (without low-grade oxidized ores)	1,100
Cuyuna, Vermilion	60
Michigan	480
Wisconsin	6
Total	1,646

These estimates include 250 million tons of ore in anticipated new discoveries.

Ore men believe production of the Lake Superior district will increase slightly over the next few years and that 94 million tons will be shipped from these mines in 1955.

The northeastern states will produce a little more ore and are expected to provide 6 million tons in 1955, as compared with an estimated 5 million tons this year. The western and southern states should hold fairly constant at 5.5 million and 8 million tons a year, respectively.

Taconite—The iron-bearing rock of the Mesabi will contribute rapidly increasing tonnages. Pilot plants are



Masterpiece by CROMOVAN

100,000 pieces per grind . . . 100% increase in production over former dies . . . is the outstanding performance of this Cromovan six station, progressive lamination die. The die punches out both rotor and stator laminations complete . . . from .025 silicon lamination sheets . . . clearance tolerance of .0007 inch per side is strictly maintained between punches and die. All cutting surfaces of this die are made of CROMOVAN.

R248

**VISIT OUR BOOTH G-446
AT THE A.S.M. SHOW**

SEE THE NEW METHOD-X MACHINING
SINTERED CARBIDES, SUPERALLOYS
AND OTHER "NON-MACHINABLE" METALS.

Firth-Sterling

STEEL & CARBIDE CORPORATION

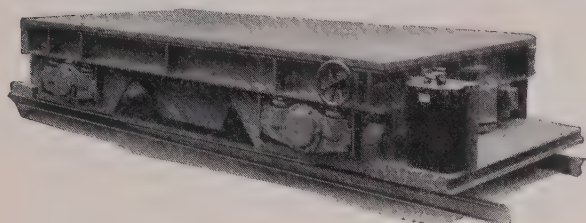
General Offices: 1330 Forbes St., Pittsburgh, Pa.

OFFICES: NEW YORK • HARTFORD • PHILADELPHIA • PITTSBURGH • CLEVELAND • DAYTON • DETROIT • CHICAGO • LOS ANGELES

ATLAS

INTRA PLANT CARS DESIGNED AND ENGINEERED FOR YOUR SPECIFIC NEEDS

STORAGE BATTERY FLAT CAR

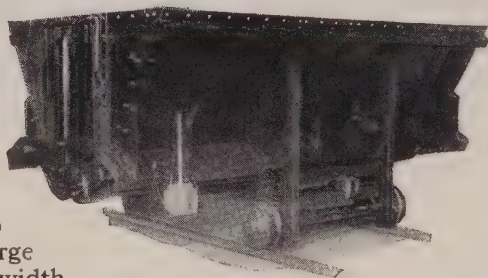


**60-TON
CAPACITY**

This self-propelled flat car operates on standard gauge track. Car provided with hydraulic electric brakes that can be operated by handwheel when long overhanging loads are encountered. These battery propelled cars are often provided with charging equipment mounted on car.

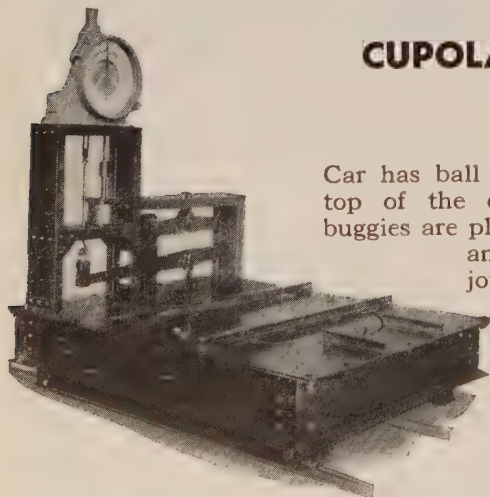
FURNACE CHARGING CAR, 8-TON CAP. CENTER DUMP

The discharge gates are so arranged as to spread the charge to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring mounted journals. Car provided with automatic engine couplers.



CUPOLA CHARGING SCALE CAR

Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.



*Send for illustrated booklet
on all types of intra-plant cars.*

**ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE**

THE ATLAS CAR & MFG. CO.

ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

being operated on taconite by several iron ore companies. Last month Reserve Mining Co. started construction on a 2.5-million-tons-per-year beneficiating plant at Beaver Bay, Minn. The plant may be expanded to 10 million-ton capacity.

Less concern is felt now over the future of our iron ore supplies than at the close of World War II, when the drain on the Mesabi range was appraised and before steel and ore interests launched a vast ore development program.

ANTIMONY

We Import Four Fifths

BOLIVIA, Mexico and the Union of South Africa are the world's leading producers of antimony and it is from these countries that the United States draws the bulk of its needs. China, Czechoslovakia, Turkey, Hungary, Greece, Algeria, Peru, and Belgium also produce substantial quantities.

United States production last year was about 2500 net tons. We used almost 16,000 tons. Imports of ore and metal were nearly 15,000 tons. Antimony is one of the metals being added to our strategic stockpile.

About 60 per cent of the antimony used in this country goes into metal products. Antimonial lead takes the lion's share, while bearing metal and type metal take large quantities.

Nonmetallic uses are for frits and ceramic enamels, paints and lacquers, ammunition primers, flameproofed textiles and in plastic.

ALUMINUM

Supply Tight, but Growing

THE United States and Canada last year accounted for about 70 per cent of the world aluminum production. This country's output was 718,000 net tons, while Canada produced 395,000 tons of a world total of 1,631,000 tons.

Russia is the third largest producer with estimated 1950 output of 210,000 tons.

Many European countries produce aluminum but their output does not bulk large in comparison with North America's.

Outlook—This year, the United States will produce about 800,000 tons. Projected expansions will raise capacity to 1,100,000 tons by mid-1953, plus an additional 80,000 tons of high-cost capacity. There is serious talk of expanding capacity to 1,700,-



New Salem-Brosius offers the metals industry better service throughout the **free world**

When the Edgar E. Brosius Company purchased Salem Engineering Company and formed Salem-Brosius, Inc., it increased the service capacity of the formerly independent organizations many-fold. Under new vigorous young leadership, the industrial furnace engineers and the blast furnace and steel plant equipment designers are pooling their talents to bring you better engineering, better manufacturing and better prices. Anywhere in the free world, you can call on the divisions, affiliates and representatives of Salem-Brosius with a new feeling of confidence. They have a better team behind them.



Contact us for heating, treating,
blast furnace equipment,
charging and manipulating solutions.

SALEM-BROSIUS, INC.,

Affiliates: Brosius Division, Pittsburgh-15, Pa.; Salem Engineering Division, Salem, Ohio;

COMPARE

your present ALUMINUM FINISHING PROCESS with these advantages of **IRIDITE[®] Al-Coat**

—see for yourself why more and more finishers of aluminum products are specifying Iridite Al-Coat for any wrought, cast or buffed aluminum part.

1. IN PROCESSING

Faster—Just one simple dip, 10 seconds or only two minutes, depending upon your finishing specifications. No sealing dip, no special drying.

Simpler—Non-electrolytic, no heating or exhaust units, operates at room temperature. No special precleaning baths required.

2. IN APPEARANCE

Clear—Protects metal without changing its original appearance.

Colored—Heavier, iridescent yellow film provides greater protection.

3. IN PERFORMANCE

Corrosion Resistance—Up to 1,000 hours salt spray on wrought stock, 250 hours on castings. Approved under government specifications.

Abrasion Resistance—Will not flake or peel from buffing, bending or scraping.

Paint Base—Blocks underfilm corrosion; grips paint, holds it firmly.

Welding—Finished surface can be spot welded, coating actually aids shielded arc welding.

Conductivity—Offers low surface resistance to electrical current.

4. IN COST

Comparative figures show that Iridite Al-Coat saves as much as 50% over other aluminum finishing processes. *Let us prove this to you.*

Write today for **FREE SAMPLES** of Iridite Al-Coat. Or, send samples of your product for test processing.

Iridite is approved under government specifications.



ALLIED RESEARCH PRODUCTS
INCORPORATED

4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

REPRESENTATIVES IN PRINCIPAL INDUSTRIAL CITIES: West Coast: L. H. BUTCHER COMPANY
Manufacturers of Iridite Finishes
For Corrosion Resistance and Paint Systems for Non-Ferrous Metals; ARP Plating Chemicals

000 tons, provided power can be made available.

Equally impressive expansion plans are heard across the border in Canada. The Dominion has tremendous sources for low-cost hydro power. Over the next three to five years, Canada will more than double primary aluminum capacity.

Ore—Although the United States depends substantially on other countries for bauxite, plenty can be found in Western Hemisphere countries. Lower quality bauxite, of course, may have to be used. Surinam, British Guiana, Jamaica, Brazil, Haiti and the Dominican Republic have valuable deposits.

Armament Needs High—As long as the mobilization effort continues with its vast demands for aluminum, the supply will be tight. Civilian uses will be restricted. When war demands ease, civilian applications for aluminum will get a big boost.

COLUMBIUM

West Didn't Get Its Share

NIGERIA and the Belgian Congo practically have a monopoly on the production of high-grade columbite concentrates. This is one of the alloying metals which enable steel to stand up under the terrific heat necessary for jet engine use. The United States is pushing for more production in Nigeria and the Congo that the metal may be available for import. We are getting only a fraction of what we need and demand will rise rapidly as the jet engine program gains momentum.

Mozambique supplies small quantities and a little is coming in from Brazil.

New discoveries are reported in French Morocco and in the Freiberg area of Germany, but the extent or richness of the deposits has not yet been determined.

Nigeria last year produced nearly 2 million pounds of columbite concentrates. The Congo output was less than 300,000 pounds.

United States output was only 4000 pounds.

MOLYBDENUM

U. S. Out in Front

EIGHTY-FIVE per cent of the world production of molybdenum comes from the United States. Last year this country produced 14,239 net tons

15 out of 24 Leading Weldment Fabricators



Among the twenty-four *top contract welding firms, fifteen regularly weld with Murex Electrodes.

More of the leaders in important industries prefer Murex Electrodes in their welding operations because they can be sure of sound welding—high deposition rates for economy and speed of production.

*Those having AAAA directory ratings.

WELD WITH...

MUREX[®]

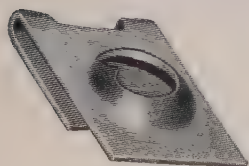
METAL & THERMIT CORPORATION 100 EAST 42nd ST., NEW YORK 17, N. Y.
ELECTRODES • WELDERS • ACCESSORIES

It might be NEWS TO YOU

only PRESTOLE
builds ALL

SHEET METAL NUTS
With a 360° Grip

Over 1,000 Shapes and Sizes

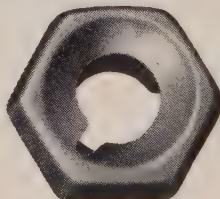


"J" NUT

"J" Nuts—to fit all metal from .020 to .090 thick. Sizes from 6-32 to 5/16 machine and sheet metal screws. Made in all finishes. Same availability on "U" Nuts as "J". All with the conical dome formed with a full 360° locking grip around screw. No prongs to flatten or break.

HEX-LOX

Hex-Lox—the Hex Nut with both the 360° conical thread grip and the side-arm thread grip. Weighs 70% less than conventional lock nuts. Has highest installation torque, prevailing torque, and back off torque. Excels in vibration tests and tensile strength. Made in 5 screw sizes from 6-32 to 1/4-20. SAE-1060 steel .016 to .020 thickness.



CAGE NUT



One-Piece Cage Nuts—combines both nut and cage in one piece. No prongs. Full 360° unbreakable thread grip. Saves material, cuts parts in half, saves handling and assembly time. Made of SAE-1060 steel in all popular sizes.

PUSH ON

Push-Ons—for smooth studs. The PRESTOLE push-on clover leaf nut has also become very popular because of its 4 point spring tension bite on smoothest studs, whether metal, fibre or plastic. All sizes and finishes.



The growing demand for more PRESTOLE fasteners is due largely to its unique, precision engineered conical grip that bites a full 360° into the root of the screw thread. It's in all PRESTOLE fasteners except those made for smooth studs. PRESTOLE fasteners are preferred because of their greater holding power. Hundreds of millions in use on automobiles, trucks, refrigerators, stoves, heaters, radio, TV and scores of other products. In writing for samples, kindly send blueprints or details of application.



PRESTOLE CORPORATION

1349 MIAMI ST. • TOLEDO 5, OHIO

of an estimated world output of 16,000 tons.

Seventy per cent of molybdenum is consumed in the manufacture of steel, to which it is added as molybdenic oxide, calcium molybdate or ferromolybdenum. It increases steel's resistance to chemical attack. More recently it has been finding an expanding market in high-temperature alloys for jet engines, gas turbines and turbosuperchargers. The advantage here is its high melting point of about 4750° F.

Molybdenum also is used as an alloying element in spring steel.

From the West—Most of our molybdenum comes from the western states, with Utah, Colorado, New Mexico, California, Arizona and Nevada the leading producers. Although we are self-sufficient in the metal and normally export it, the supply now is extremely tight due to the large increase in demand.

Other Sources—Chile was the second largest producer in 1950, although output was only 880 tons. China, Mexico, Norway, Canada, Australia, Russia, Yugoslavia, Rumania, Turkey, Greece, Peru, and some other countries produce small quantities.

MANGANESE

Slag Recovery May Help

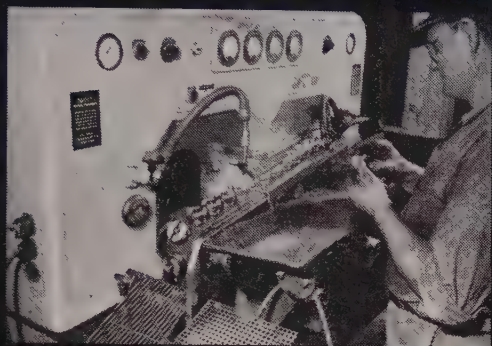
MANGANESE presents a complicated problem to the steel producing industry. Mills need more of it than any other metal except iron. Between 1.5 and 2 million tons are required annually.

More than 90 per cent of our manganese now comes from other countries. Russia supplied about a third of our requirements until supplies from that source were choked off. Major foreign sources of supply now are India, Union of South Africa, Gold Coast, Brazil and Cuba. Primitive mining and transportation methods in India and South Africa hinder shipments from those countries. This country is helping to improve those situations. Cuba's reserves are dwindling. Brazil has several promising deposits which are being developed further. A new deposit is reported in Labrador and likely areas in other Western Hemisphere countries are being explored.

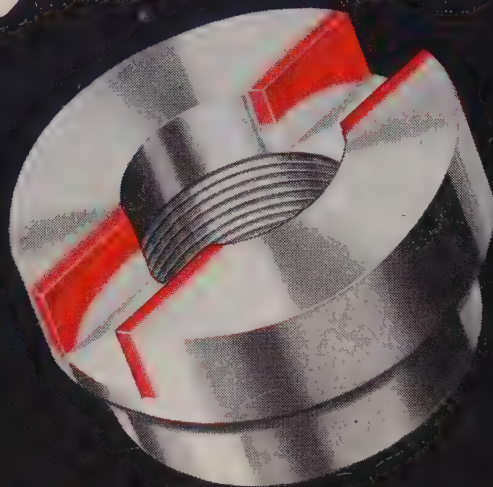
Domestic Ores Low Grade — The United States has large quantities of low-grade manganese ore but so far no method to beneficiate these ores on an economically sound basis has been commercially demonstrated. Much research is underway and sev-

**Copper-plating
Carburizing
Cleaning
Rechasing threads**

Eliminated



This 20 KW, 450,000 cycle TOCCO iron tube oscillator unit handles 600 transmission nuts per hour.



LABOR COSTS *Cut 78%*

with **TOCCO*** Induction Heating

THE JOB—International Harvester Company, world-famous builder of farm machinery, uses TOCCO for the selective hardening of the special tractor transmission nut shown above. Only the contact surfaces are hardened. The bottom channel must remain soft or the part will crack, and any distortion would affect the threads. Material is C-1045 steel; production required 600 per hour.

THE RESULTS—Formerly the part was copper-plated before milling the slot. Then the slot was milled, the part carburized and hardened in a batch-type furnace. Finally the parts had to be cleaned and the threads rechased after hardening to assure proper fit. Now the adoption of TOCCO hardening eliminates these operations, stops distortion and saves \$3.50 for every batch of 600 pieces.

● This job, typical of thousands of cost-saving TOCCO installations all over the world, may suggest ways you can reduce costs and speed production on hardening, brazing, annealing, forging or melting jobs in your own plant. Experienced TOCCO engineers are glad to work with you—without obligation, of course—for similar cost-cutting results.

THE OHIO CRANKSHAFT COMPANY



**NEW FREE
BULLETIN**

Mail Coupon Today

THE OHIO CRANKSHAFT CO.
Dept. S-11, Cleveland 1, Ohio

Please send copy of 60-page catalog "TOCCO Induction Heating."

Name _____

Position _____

Company _____

Address _____

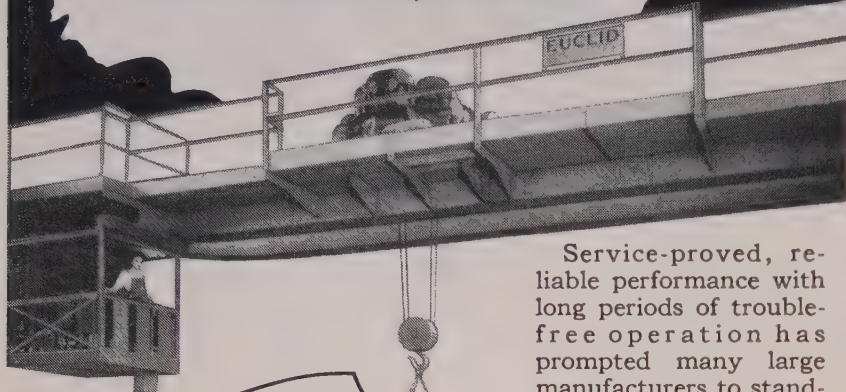
City _____ Zone _____ State _____



TOCCO

*Trade Mark Reg.
U. S. Pat. Off

There's a **STANDARD EUCLID**
to **HANDLE** the **BIG MAJORITY** of
YOUR CRANE REQUIREMENTS!



**STANDARD MODELS
MEET OVER 90%
OF YOUR
REQUIREMENTS**

THE EUCLID CRANE & HOIST CO.

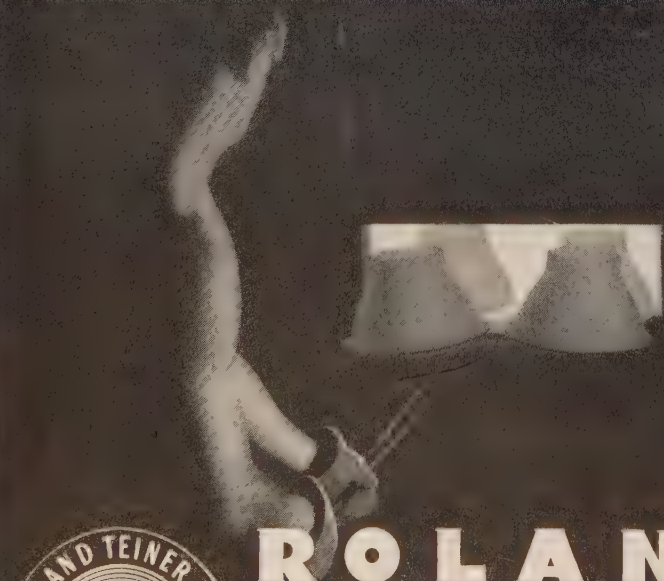
364 CHARDON ROAD • EUCLID, OHIO

Service-proved, reliable performance with long periods of trouble-free operation has prompted many large manufacturers to standardize on Euclid Cranes.

A large percentage of orders are **REPEAT ORDERS** for cranes, $\frac{1}{2}$ to 100 tons capacity and in spans up to 100 ft.



FILLING A GOVERNMENT ORDER. Stainless steel jet engine components are heated in annealing oven, prior to re-spinning. An example of the all-gage—all-metal—any quantity—spinning capacity available at Teiner. Write for newest color brochure 51F.



**ROLAND
TEINER**

CO. INC. 134 TREMONT ST., EVERETT 49, MASS.

eral processes hold considerable promise. Practically all domestic metallurgical manganese now comes from Anaconda, Mont.

Slag Offers Promises—More attention is being directed toward recovering manganese from open hearth slag which contains from 4 to 12 per cent manganese. The Bureau of Mines and the American Iron & Steel Institute have a process in the pilot plant stage. Several private companies have developed processes for which high claims are made. Should these processes prove out, they could make the United States largely self-sufficient in manganese.

MAGNESIUM

Raw Materials Aplenty

PRIMARY magnesium production is subject to violent fluctuation. In 1943, the United States produced 184,000 net tons. Three years later, output dropped to about 5000 tons. Last year's production was about 16,000 tons. Now it is on the climb again and 1951 output should treble that of last year.

Russia now is the second ranking producer and is believed to have turned out 6600 tons in 1950. United Kingdom is in third place with 5400 tons. Reports on production of several former important producers are not available.

Capacity Reactivated—When war clouds began to gather again, the government announced its plans to reactivate six of the plants held in standby—those located at Painesville, O., Velasco, Tex., Canaan, Conn., Manteca, Calif., Wingdale, N. Y., and Spokane. These have capacity to produce 98,000 tons of primary metal. Output from these plants will cost more than metal from Dow Chemical's Freeport plant and will be stockpiled by the government.

Power Is Problem—Raw materials are no problem in magnesium's future since it is produced mostly from seawater. Power is a potential bottleneck. The electrolytic process requires nine kilowatt hours per pound. The Pidgeon process requires about half as much, most of which is used in making ferrosilicon used in the process.

ZINC

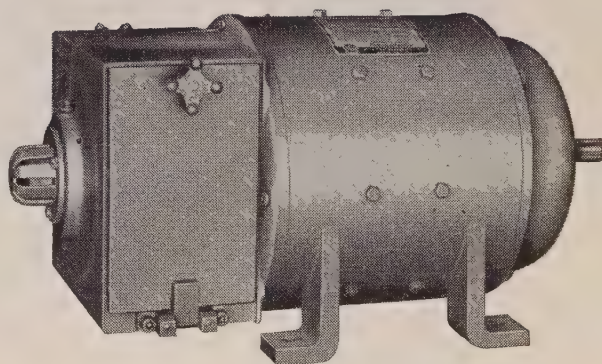
Demand Exceeds Supply

WORLD production of zinc in 1950 was the highest since 1943, and modest increases will be made in 1951.

MOTORS for Runout Tables

★ ★ ★
25 YEARS of Reliance experience
makes them the best you can use for the job!

Strongest proof of the outstanding performance and dependability of Reliance Motors lies in the fact that you find more of them on runout tables than any other make. Whether the installation calls for D-c. Motors with direct coupling, as gearmotors or as floating motors, the Reliance experience of over a quarter of a century in powering runout tables assures you the *best* motors you can use to keep materials moving. In supplying completely engineered drives for operation of runout tables and conveyors, Reliance Application Engineers effectively combine their practical "know-how" with that of equipment manufacturers.



RELIANCE TYPE 'T' HEAVY DUTY D-C. MOTORS

THE TOUGHEST MOTORS EVER BUILT!



Reliance D-c. Motors in runout table service are proving Type 'T' as "The Toughest Motors Ever Built". Write today for Bulletin C-2001 that contains data to select the right D-c. motor for any job.



Sales Representatives in Principal Cities

RELIANCE ELECTRIC AND ENGINEERING CO.



When you need circular rolled and welded steel products in volume, pick up your phone and call the Cleveland Welding Company, Cleveland, Ohio, Woodbine 1-2820. The man you talk to will be a specialist in the mass production of these items, and with specialized equipment plus over 40 years experience, he has the necessary know-how to solve your welded steel, hoop, band and ring problems economically and efficiently. Each year we manufacture millions of steel rings for jet aircraft engines, bogie bands and turret rings for tanks as well as other types of rings, bands and weldments from alloy and carbon steels.

Many leading armament manufacturers have found that because of our mass production and years of experience, we can often quote a lower price than their own internal costs. Phone or mail us details on your volume requirements and let us quote.



THE CLEVELAND WELDING CO.
West 117th St. and Berea Road • Cleveland 7, Ohio
a subsidiary of
AMERICAN MACHINE & FOUNDRY COMPANY

Despite this increase, production will be inadequate to supply the accelerated consumer and defense demand. Limitations on the uses of zinc will continue.

The United States accounts for about 30 per cent of the world's zinc and is the leading producer. But its output falls short of domestic requirements. This year we will produce only about 70 per cent of our requirements. Canada and Mexico, which rank second and third among the world producers, supply the bulk of our imports.

More Ore, Less Slab—Mine production in the United States last year was 618,000 tons, while smelter production was about 300,000 tons higher. The difference was met by imported ores and by drawing on accumulated stocks of zinc ore. These stocks were reduced to rock bottom by the end of 1950.

So despite a possible 10 per cent increase in mine production this year, slab zinc production likely will be less.

Europe to Lift Output—Although North America produces more than half the world zinc supply, production is well scattered over the remainder of the world. Europe produces about 400,000 tons and projects are underway to increase output, particularly from mines in Belgium and Germany.

Russia is estimated to have produced about 142,000 tons, an increase of 50 per cent over production at the end of the war.

About 45 per cent of United States zinc is used in galvanizing. Die castings take about 30 per cent and brass products about 15 per cent of the remainder.

COPPER

A Continuing Problem

WHENEVER this country rearms copper quickly becomes a problem. Demand soars and there is no quick way to boost production to accommodate the increased requirements. At the moment, copper is threatening to replace steel as the metal which will determine the ceiling on our productive capacity.

United States is the world's leading producer and for the past 30 years our mine productive capacity has held fairly constant at around 900,000 net tons annually. Until the mid-20s, this country produced more than half the world supply and exported substantial tonnages. The mines in Chile, Northern Rhodesia, Canada and the Belgian Congo be-

came more important. United States became a copper importer in the late 30s.

In the Ground—Ninety per cent of the known world reserves, estimated at 100 million tons, lie in Chile, South Central Africa, the western United States and southern Russia. African deposits are the richest averaging 3 to 6 per cent copper, compared with 2 per cent copper in Chile and generally less than 1 per cent in the United States deposits.

United States companies control the mining of about half the world's copper, Great Britain controls about a quarter and the remainder is controlled by many countries.

Russia produces about one-fifth as much as the United States and in 1950 accounted for an estimated 240,000 tons.

No Quick Increase—We cannot expect much relief from the copper shortage for some years. During the emergency here and ahead, essential requirements will be met by reducing the less essential uses.

The reason for this is that all phases of copper production—mining, smelting and refining—require years, not months, to get into operation. When the seriousness of the copper shortage was recognized after the Korean outbreak, industry men hoped for a 10 per cent increase in domestic copper production. The mine strike this summer pretty well wiped out those hopes.

Stockpile?—Government stockpiling is an additional load on producers. Just how large this stockpile is remains secret for security reasons, but it generally is guessed at about 500,000 tons. This would be equivalent to about four months' consumption at the current rate.

LEAD

Bidding Is Competitive

ALTHOUGH the United States is the world's largest mine producer of lead, it depends largely on imports and scrap to fill its needs. These three sources of supply are of about equal importance.

Our position in lead is complicated by the fact that the bidding for lead in the world market is competitive. It is difficult for American consumers operating under price ceilings to compete with foreign buyers in the world market.

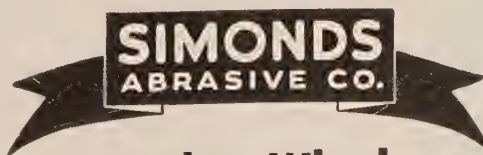
Fortunately Mexico and Canada are among the other leading producers and we have certain advantages in trade relations and geography.

The Production Picture—World lead production last year amounted to

He has a
grinding
problem
well in hand



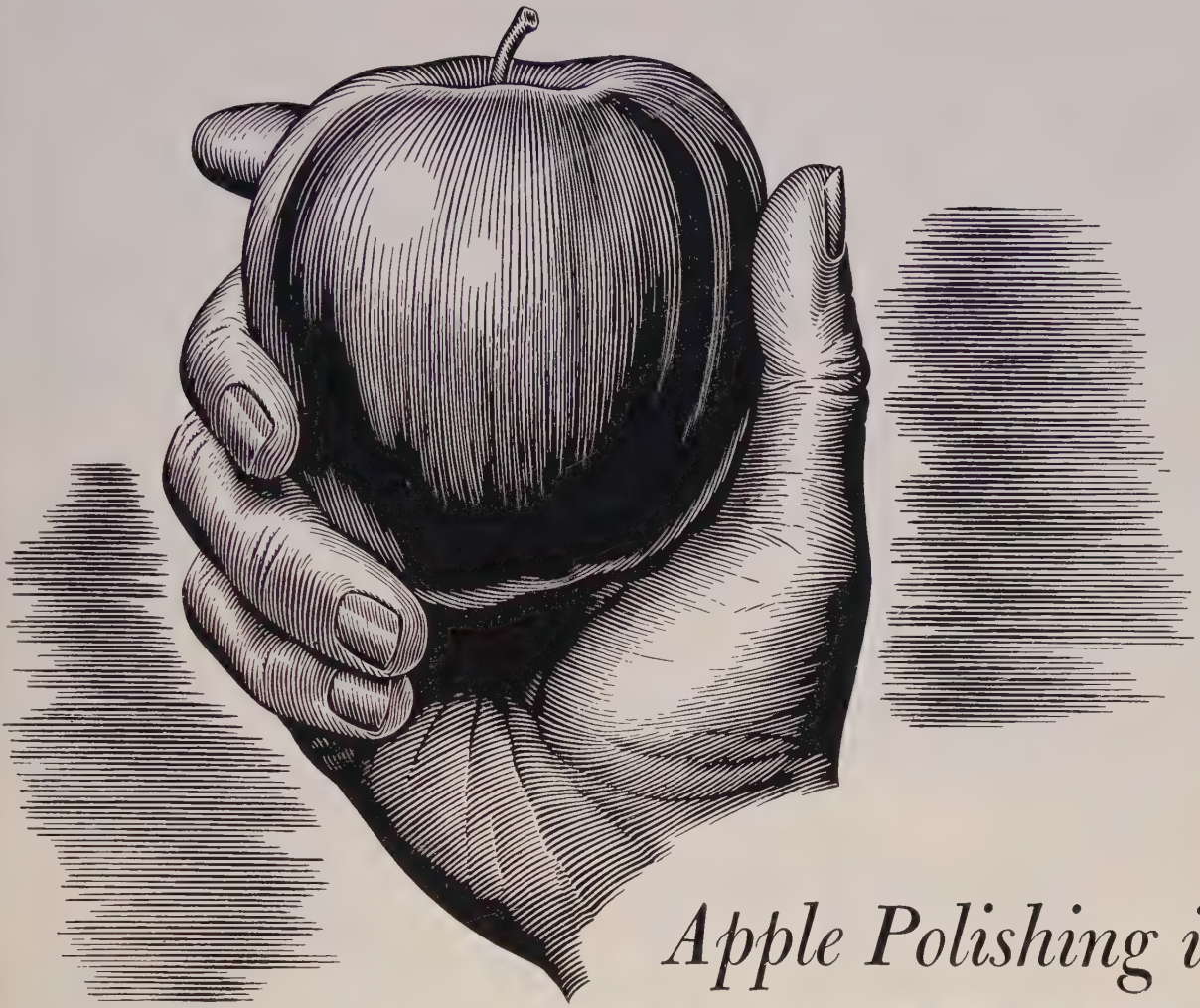
How to get grinding wheels exactly suited to his jobs! That's his problem, and he's looking in the best place for the right answer... Simonds Abrasive Company's Grinding Wheel data book. It describes Simonds complete line and lists everything you need for top grinding efficiency... grinding wheels of all sizes, mounted wheels and points, segments and abrasive grain... accurately specified and made by Simonds Abrasive Company, a major manufacturer of grinding wheels for almost 60 years. Write for data book and name of your distributor.



Grinding Wheels

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.



Apple Polishing is a **HAND OPERATION**

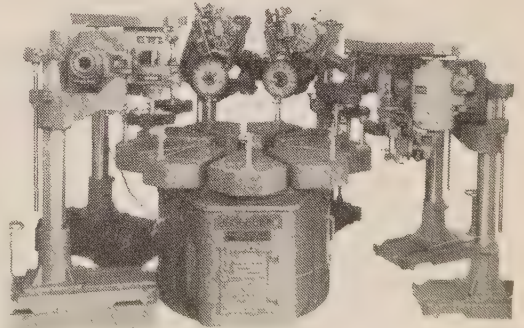
BUT METAL polishing is not — at least it shouldn't be, not when Packer-Matic machines can buff, grind, or deburr far faster and more efficiently than slow, costly hand finishing. Packer-Matics increase uniformity, save floor space, and cut labor cost — one unskilled operator replaces many skilled finishers. If you consider your volume too low or your products too varied for completely automatic equipment, let us run a test on your product in our plant, without obligation.

Your factory-trained Packer representative can give you complete information about continuous, indexing, or straight-line Packer-Matics . . . about the many unique features of Packer machines, designed to meet specific requirements, built to keep meeting them through years of continuous service.

Your Packer-Matic is thoroughly tested before it leaves our plant, and fully guaranteed for one year. Investigate Packer-Matic finishing today: write to the Packer Machine Company, 250 Center Street, Meriden, Conn.

PACKER-MATIC

AUTOMATIC MACHINES FOR BUFFING • POLISHING • DEBURRING • GRINDING
THE PACKER MACHINE COMPANY • MERIDEN, CONN.



No. 14-9 Rotary Indexing, equipped with work spindle oscillating units.

NEW!

READY-POWER

Diesel-

electric

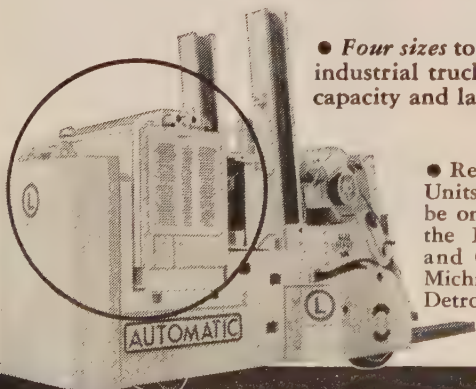
units

FOR HEAVY-DUTY ELECTRIC INDUSTRIAL TRUCK OPERATION

● Featuring amazingly low-cost operation, long life and reduced maintenance.

● Four sizes to power electric industrial trucks of 6,000 lb. capacity and larger.

● Ready-Power Diesel-Electric Units and Gas-Electric Units will be on display in booth G-131 at the National Metal Exposition and Congress, October 14-19, Michigan State Fair Grounds, Detroit.



The READY-POWER Co.

3824 Grand River Ave., Detroit 8, Michigan
Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

could be satisfactorily separated from copper.

Even then there was little market for nickel and in 1900 nickel consumption was only 4000 tons. World War I gave the metal its first big boost when it was used extensively to give toughness to armor plate. After World War I the bottom dropped out of the market and civilian uses for nickel had to be developed. The growing mechanization of industry with higher speeds and heavier loads and the rapid growth of the automotive industry helped nickel to an almost phenomenal growth. By 1939, production reached 130,000 tons and during World War II soared to 180,000 tons.

INCO Story—The story of nickel as we know it is essentially the story of International Nickel Co. which mines about 90 per cent of the Sudbury nickel. The remainder of Canadian nickel is mined by Falconbridge Nickel Mines Ltd.

While nickel production is being increased, conservation will be stressed as long as this country's armament program continues in high gear. There will be little nickel for civilian uses and many military uses will be restricted.

COBALT

Future Is Brighter

COBALT demand skyrocketed with the start of the Korean affair, and it became one of the first metals to cause concern. It is an important element in jet engines, electronic equipment including radar, generators for aircraft and tanks and has important applications in atomic energy projects. In civilian life cobalt is used in high-speed cutting tools, drills, welding rods, valves and magnets.

The United States has been using about 60 per cent of the world's production, which in 1950 amounted to 7800 tons. Ninety per cent of our supply comes from overseas. Belgian Congo is the leading producer and accounts for about 70 per cent of the total. Northern Rhodesia and French Morocco are fairly important producers and should supply more as ECA funds are used in the development of resources in those countries. The United States and Canada produce relatively small amounts. Production in both the Western Hemisphere countries can be expanded.

Balance by 1953—Plans for increasing output indicate that the supply-demand picture for cobalt will get much better and will be in approximate balance by 1953, barring an all-out war.

Two MUSTS for DEFENSE PRODUCTION

SCRAP
for Basic Production



FASTENERS
for "End Product" Fabrication



**OVER 2% OF THE STEEL PRODUCED IS
USED TO FASTEN THE REST TOGETHER...**

Steel is a basic commodity. Upon our ability to produce steel, and more steel, rests the success of our rearmament program and the very security of our country.

Scrap is an important ingredient of new steel. More and more scrap will be required as production expands.

But what about the end products of steel—the machinery, the weapons, the vehicles, the thousands of products fabricated from steel?

That's where fasteners are a **MUST**. Without fasteners most of the steel produced would be of little use.

So when you think of steel as an important commodity, think of fasteners, too. *Both* are vital to our industrial economy and to the success of our defense effort!

The home of "quality controlled" fasteners



**Lamson
+ Sessions**



Cobalt occurs in many mineral forms and in many countries. Seldom do cobalt minerals occur by themselves, nor is the metal mined for itself alone. Cobalt often is found in chemical combination with arsenic in ores of nickel, silver and gold; with sulphur it is found with lead, zinc and copper; and in oxide form is often accompanied by copper.

As production of these metals is intensified, production of cobalt can be expected to rise. In Fredericktown, Mo., a new recovery process may recover 500,000 pounds of cobalt a year from lead and zinc ore refin-

ing. As research develops new processes for separating cobalt from its close affinity for other metals, Canadian and domestic ores may eventually supply most of our needs.

TUNGSTEN

Outlook Potentially Good

TUNGSTEN currently is in tight supply because supplies from China, the world's leading producer, no longer are available. But unlike tin and columbium, tungsten is widely

scattered over the globe and in time we can insure adequate supplies.

The United States produces about one-third of its needs. In 1950, we produced 4853 net tons of concentrates containing 60 per cent tungstic oxide (WO_3), or about 13 per cent of the world total. Domestic production can be increased and output in other friendly nations also can be upped.

Historically, we have obtained large quantities of tungsten from China, which last year produced more than 12,000 tons, about 40 per cent of the world total, and from Korea. Wolframite and scheelite ores now are being imported from Australia.

Uses—Tungsten consumption soars sharply during rearmament. It has been a feast and famine metal, which accounts for the fact that exploration and development have not been carried far enough to make us self-sufficient.

High-speed cutting steels take more tungsten than any other use. It also is used in steels for armor-piercing shells, magnets, jet aircraft parts, erosion-resistant linings for heavy ordnance and other applications where steel must stand up under intense heat and pressure. In recent years, 40 per cent of our tungsten consumption has gone into ferrotungsten, the form in which most of the metal is introduced to steel. Another 20 per cent went to high-purity concentrates to be charged directly into steel baths.

The remainder went into tungsten metal powder and other tungsten products to make cemented carbides, electric lamp filaments and other products.

TIN

Past, Future Storm Center

VIOLENT price fluctuations, controls, scarcities and oversupplies mark the past of tin. Probably they will characterize its future as well.

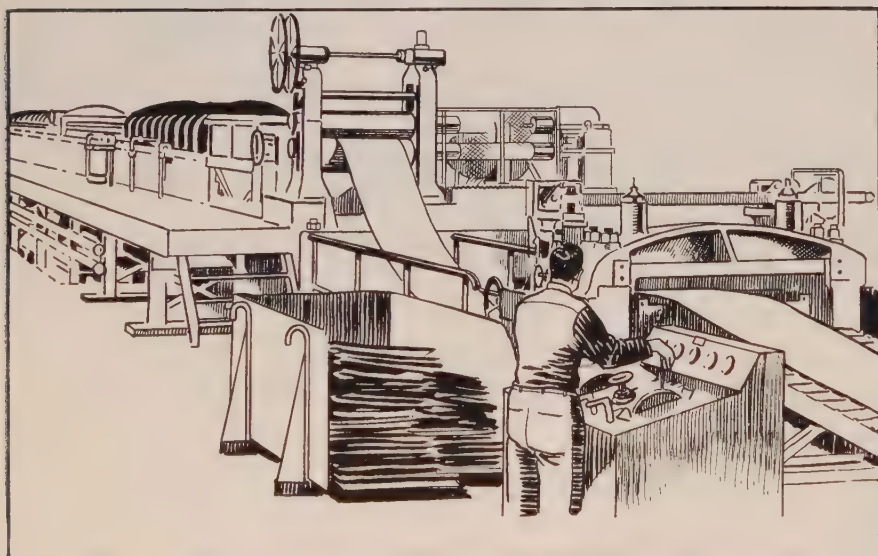
The United States, user of half the world's output, is almost wholly dependent on imports. Tin-bearing ores of this country have been examined periodically and discarded. They are too low-grade to process.

When you think of tin, you think of Malaya, which produces about one-third of the world's total. Malayan production was badly disrupted during the Japanese occupation during World War II and had been slowly climbing back to normal operations. Malaya last year contributed 57,500 long tons toward world output of 174,400 tons. This was the highest production since 1941 when world output hit a record 245,000

PICKLE CONTROL

means

LESS ACID and
MORE METAL



**FOR BETTER PICKLING
AT LESS COST
USE NEP INHIBITOR**

**PRODUCERS OF SUMFOAM COMPOUND AND NEPTUNE
PICKLING ACCELERATOR**

parkin CHEMICAL COMPANY

Highland Bldg. MONTROSE 1-0176

PITTSBURGH 6, PENNA.

**PICKLING
SPECIALISTS**

**Parkin of
Pittsburgh**

**IN STEEL
SINCE 1860**

tons, of which Malaya produced 78,000 tons.

Second largest producer is Indonesia. Third is Bolivia. Each accounts for about one-fifth of world output. Other major producers are in the Far East and in Africa.

Russia claims to be self-sufficient in tin, although production is believed to be no more than 8000 long tons annually.

Prices—World tin prices fluctuated wildly during 1951. Before Korea, the price was fairly stable at around 75 cents a pound. A rise began with the outbreak of hostilities and continued to a peak of \$1.83 in February, 1951. Last March, the United States announced it had quit purchasing for stockpiling and concentrated buying in Reconstruction Finance Corp. This helped to drive the price down to \$1.03 in September.

Uses—About half the primary tin used in the United States goes into tin plate. Other major uses are for solder, bronze, babbitt, collapsible tubes and foil and for tinning.

CHROMITE

We Depend on Imports

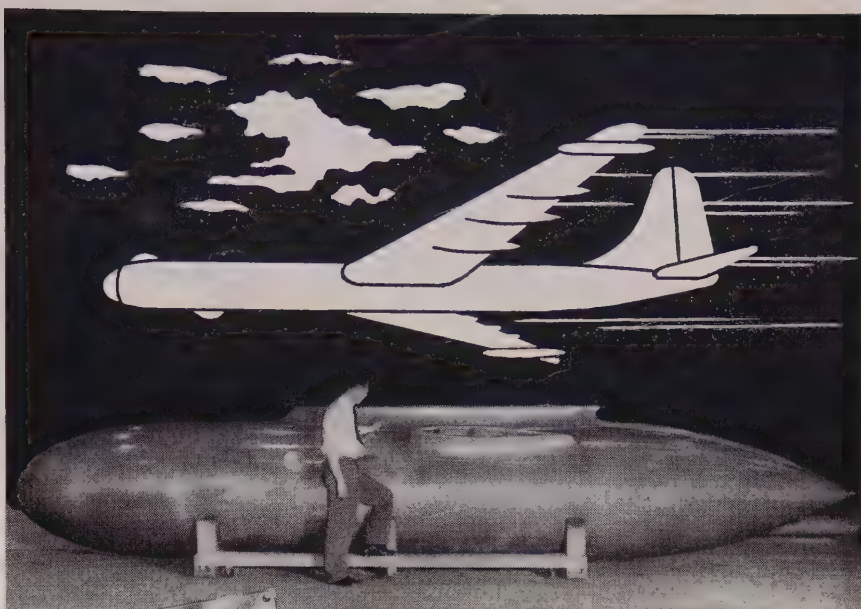
ALTHOUGH chromium is in group II in NPA's basic materials list (indicating supply and demand are in approximate balance) the United States depends almost wholly on imports. Russia is the leading producer and until the last year or two was our leading supplier of metallurgical grades. Turkey and Southern Rhodesia now have assumed greater importance as a supplier of metallurgical grades while the Union of South Africa, the second largest producer, supplies a large proportion of chemical grades and the Philippines and Cuba send us substantial quantities of refractory grades.

Domestic production is reviving slightly but is not overly significant in view of requirements.

Accent on Alloys—Rearmament is causing consumption of metallurgical grades to rise rapidly. About half the chromite used in this country goes into the chrome alloy steels, now needed in larger quantities for defense applications requiring stainless, heat-resistant and corrosion-resistant metals.

Second largest use is for refractory material for lining and repairing furnaces for both ferrous and nonferrous metals.

Chemical uses, for pigments, tanning and electroplating, take substantial quantities.

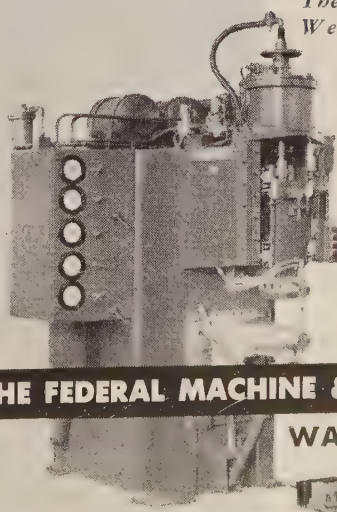


Federal RESISTANCE WELDERS USED IN CONSTRUCTION OF LARGEST KNOWN FUEL TANK

The huge external aircraft fuel tank pictured above is one of a type being produced for the Air Forces by the Ryan Aeronautical Company. Designed by Ryan the tanks are fabricated of aluminum alloys, seam welded to MIL-W-6860 (AN-W-30) on Federal Welders where Ryan is making gas-tight seams without the use of sealing compounds.

Federal Resistance Welding equipment enables Ryan to produce a smoothly streamlined tank that has no external riveting or protuberances to disturb the aerodynamic flow over the skin. Too, resistance welding the tanks eliminates added weight.

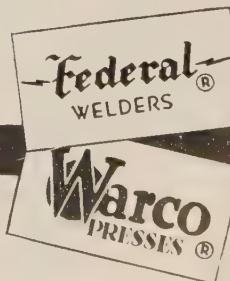
High production is another important factor and Ryan, like other aircraft and automotive manufacturers, finds Federal Resistance Welders the most efficient method for producing quality assemblies at high speeds.



The latest Federal Three-Phase Aircraft Spot Welder for welding stainless, aluminum, nickel alloys and carbon steels. If you are interested in Three-Phase Resistance Welding be sure to talk with the Federal Representative in your area. There's a reason why Federal is First in Resistance Welding. Send for your copy of the latest Federal Three-Phase Bulletin.

THE FEDERAL MACHINE & WELDER CO.

WARREN, OHIO



CUTTING YOUR COST ON

Stampings



The STAMPINGS DIVISION

of the Laminated Shim Company is equipped to produce anywhere from one to several million stamped parts. Whatever the quantity, we have the equipment and experience to choose the most economical stamping technique without partiality.

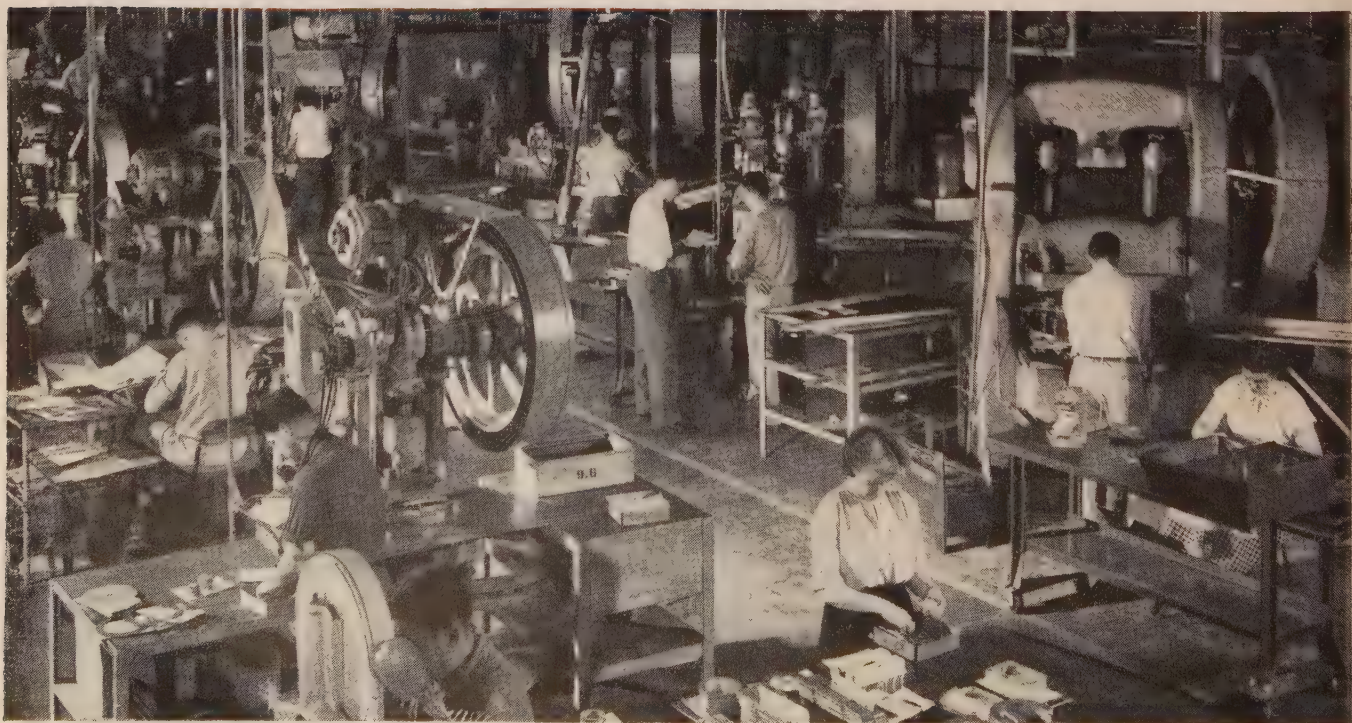
Given full information by our customers, we carefully study the costs of appropriate methods — to your profit.

**RECOMMENDED BY 1500
CURRENT, ACTIVE CUSTOMERS**

**YOU SAVE MONEY WHEN YOUR
SUPPLIER IS FULLY EQUIPPED FOR
THE MOST EFFICIENT METHOD**

For MINIMUM UNIT COST — The Production Method
The Production Method is used whenever the cost of very fine dies can be spread over enough pieces to result in a low unit cost. A first-class tool and die shop plus a wide range of efficient presses are our secret of economical production.

A new hope for further reduction in costs is our own newly developed Hecht-type die. Although not yet universally applicable, the low cost, but permanent, Hecht tools are already saving thousands of dollars for our customers by slashing the costs of standard dies.



FOR LOW TOOL EXPENSE — OUR SHORT RUN METHOD

For runs of lesser quantity where contour and material are suitable, inexpensive temporary-type dies are used to blank contours. Bolt holes and interior diameters are added in separate press operations. Special purpose presses, custom-adapted for this type of work are what make the STAMPINGS DIVISION a strong competitor in this field where original techniques are so important.

For best planning, we should be informed of your *total* requirements of a given part, not just your immediate needs. This is important in determining at the tooling stage whether the Production or Short Run Method will be more economical over the life of the part.



Modern, Fully Equipped Tool and Die Shop

TO AVOID DIE COST COMPLETELY — Our Machine-Cut Method

The economical way to produce from 1-100 parts is our dieless duplication by the Machine-Cut Method, a STAMPINGS DIVISION specialty. Contour sawing, rotary shearing, bending and grinding equipment is used rather than normal stamping equipment. The only dies used are right from our immense stock, on hand for your use. Here is a valuable low cost service on small volume, experimental or pilot orders.

QUALITY CONTROL AVOIDS REJECTS

Careful and complete checking against blueprint specifications shields our customers from the schedule disruptions caused by rejected orders. Our Quality Control Department operates in *addition* to the usual visual inspection routines of most stamping houses.

Our plant is an approved source for many of the most particular purchasers in industry.

*Low Cost Production
Requires a Full Range
of Press Capacities and Speeds*

MATERIALS AND PRESS CAPACITIES

We offer stampings in brass, steel, aluminum, copper, plastic, special alloys — any material that can be punched. Press capacity to 100 tons, 24 inches square, with shallow draw to $\frac{3}{4}$ " depth.

FREE!

12 PAGE BOOKLET
"SERVICE IN STAMPINGS"

Full of helpful facts
on buying stamp-
ings. Profusely il-
lustrated.



STAMPINGS DIVISION

LAMINATED SHIM COMPANY, Inc.

UNION STREET

GLENBROOK, CONN.

Manufacturers of the famous **TAMINUM** shims that peel for adjustment

STAMPINGS DIVISION, LAMINATED SHIM COMPANY
3410 Union Street, Glenbrook, Conn.

Gentlemen: Please rush me my free copy of "SERVICE IN STAMPINGS".

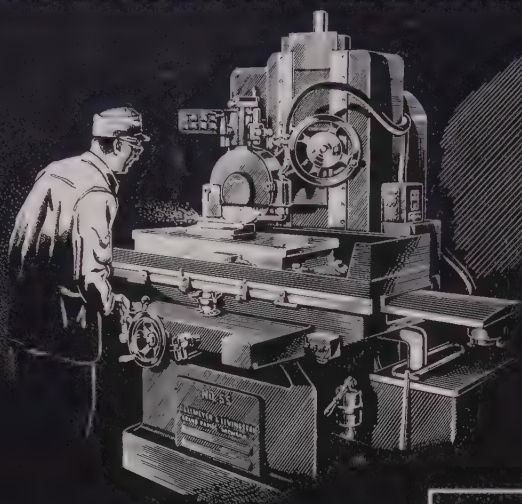
Name _____ Title _____

Company _____

Street _____

City _____ Zone _____ State _____

WHEN THE DECISION IS PRECISION...



Where extreme tolerances are not required, the choice of any particular grinding machine may not be too important. But, where absolute precision is demanded, the choice is usually *Grand Rapids*.

Defense orders make it impossible to fill orders as quickly as we desire—but we know our customers can appreciate the reasons for delay. As always we'll do our best to serve you.

GALLMEYER & LIVINGSTON CO.
307 Straight Ave., Grand Rapids, Mich.

Grand Rapids Grinders

—World's finest



**GALLMEYER
& LIVINGSTON**

NEW
THE ONLY PLANT IN EASTERN U.S.

EQUIPPED FOR

STEEL PICKLING
COILS UP TO 48" WIDE



Prompt Quality Service

- ROLLER LEVELLING
- EDGE ROLLING
- COIL SHEARING
- SLITTING

MARSAM CORPORATION

Subsidiary: AMERICAN TOOL & SUPPLY CO.

OFFICE: 822 FRICK BUILDING, PITTSBURGH 22, PA. PLANT: McKEES ROCKS, PA.

PICKLING coils:

1" to 48", 10 to 20 gauge
100 to 10,000 lbs.

SHEETS & PLATE: Any width,
any length, any thickness.

CAPACITY: 25,000 tons/month.

One World in Metallurgy?

(Continued from Page 119)

give added flexibility. Internal sheath circumference is about 5 per cent more than that of conventional three-conductor oil-filled cable, but the difference in internal cross section area is 35 per cent in favor of the flat type, with corresponding reduction in weight. The flat sheath sides give the necessary membrane effect throughout the cable length in order to compensate for the change in oil volume at different loads to avoid the formation of ionized voids in the dielectric.

Austrian Plants Small — No shortage of university-trained metallurgists is being experienced in Austria, according to Hans Reichert of Liesing, Boscham & Co. in Wein, producer and refiner of aluminum alloys and the white metals. Most Austrian plants are small, employing from 100 to 500. Technical talent in past years has tended to gravitate to Germany and other European countries where industry is on a larger scale. However, there are two large continuous rolling mills operated by the former Goering steelworks and the outlook is for a higher volume of production in both nonferrous and ferrous fields. The need for standardization of nomenclature and systems of measure is critical.

Need Magnesium for Alloying—Industry in western Germany has recovered rapidly in the postwar years. Aluminum production, to cite merely one example, is back to a rate of 85,000 tons a year, or about 85 per cent of prewar. Five plants are in the field. A stumbling block is the restriction on production of magnesium for alloying. At present, magnesium aircraft scrap is being used for this purpose, but the supply will be exhausted in a year, when some means for importing the metal will have to be developed. Aluminum goes mainly to such fields as utensils, buildings, architecture and the like. Biggest extrusion press now operated has 5000-ton capacity, the larger wartime units having been dismantled and shipped out of the country. Continuous casting of both aluminum and copper in 4-6-inch round billets by the Junghans process is proceeding apace, according to Paul Brenner, director of research laboratory, Vereinigte Aluminum Werke, Bonn.

Aluminum producers in Japan are also confronted with restrictions on magnesium, although there is a stockpile on hand sufficient for one year's requirements. However, in the opinion of Tukasa Kawamura, head of the manufacturing department, Nippon

ko Copper Works, Tochigi-Ken, aluminum producers in his country are faced with costs of bauxite double those of European reduction plants. This, added to the relatively poor condition of equipment, makes export of products like aluminum cable and sheet practically impossible. Industry in Japan has been fairly well rebuilt since 1945, production of automobiles, trucks and tractors being back to a level of 30,000 a year, against perhaps 50,000 prewar.

Japan has always been a center of metallurgical education and training, with its seven large universities attracting a large registration. There are still plenty of students, but a lack of trained instructors and professors to handle them.

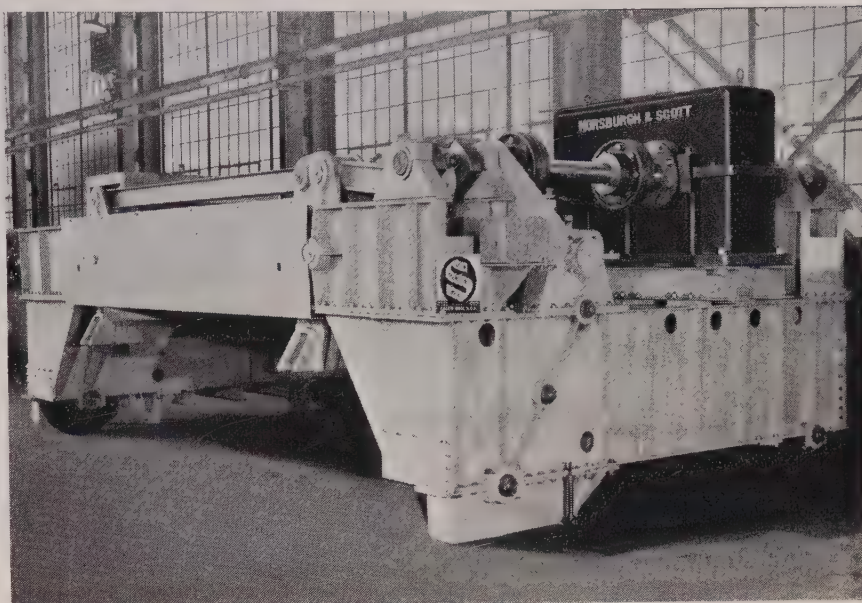
Mines Improved; Labor Unimpressed—Coal is the bottleneck in Australia's expanding iron and steel industry. Despite mechanization of mines, improved housing and working conditions for miners, it continues difficult to persuade working people to take full advantage of the improved equipment. They seem to feel that hard work can result in only another depression, and even the incentive of more pay for more work has little persuasive power. Yet the coal must be had somehow, since there is no oil or gas of any consequence on the continent. A seventh blast furnace of 1500-ton capacity recently has been brought into production, bringing daily output close to 7000 tons. A disturbing fact is that ash content of coking coals has gradually climbed to 10-12 per cent, whereas it used to be around 7 per cent.

Industries "down under" as explained by Dr. Howard Knox Worner, professor of metallurgy at the University of Melbourne, are classed as primary, secondary and tertiary. Primary involves the reduction of ore and the casting of ingot material. Secondary is the working of ingot to semifinished and finished material; tertiary is the fabrication of the finished product. About 50 per cent of Australia's gross annual income is secondary industry.

Shipping Tungsten Ores—Export of high-manganese (10-12 per cent) iron ores to the U. S. may be an important new activity, as is the shipment of concentrated scheelite and wolframite ores for reduction of their tungsten content.

There are no aluminum reduction plants in Australia, although there is some continuous casting of ingot received from Canada, along with its rolling into sheets, bars, tubes and related shapes. Large new water power installations are being erected

Giving a lift to 56,000 pounds of



soaking pit cover through . . .

H & S REDUCERS

● The above photograph shows a soaking pit cover crane designed and built by Salem Engineering Company. Two Horsburgh & Scott Helical Speed Reducers are used on each crane...the lift drive handles a cover weighing about 28 tons and operates at a speed of 6' per minute...the traverse drive moves the crane at a speed of 88' per minute. Many of these cranes have been operating very satisfactorily for twelve to fifteen years...actual tribute to complete engineering design.

THE HORSBURGH & SCOTT CO.

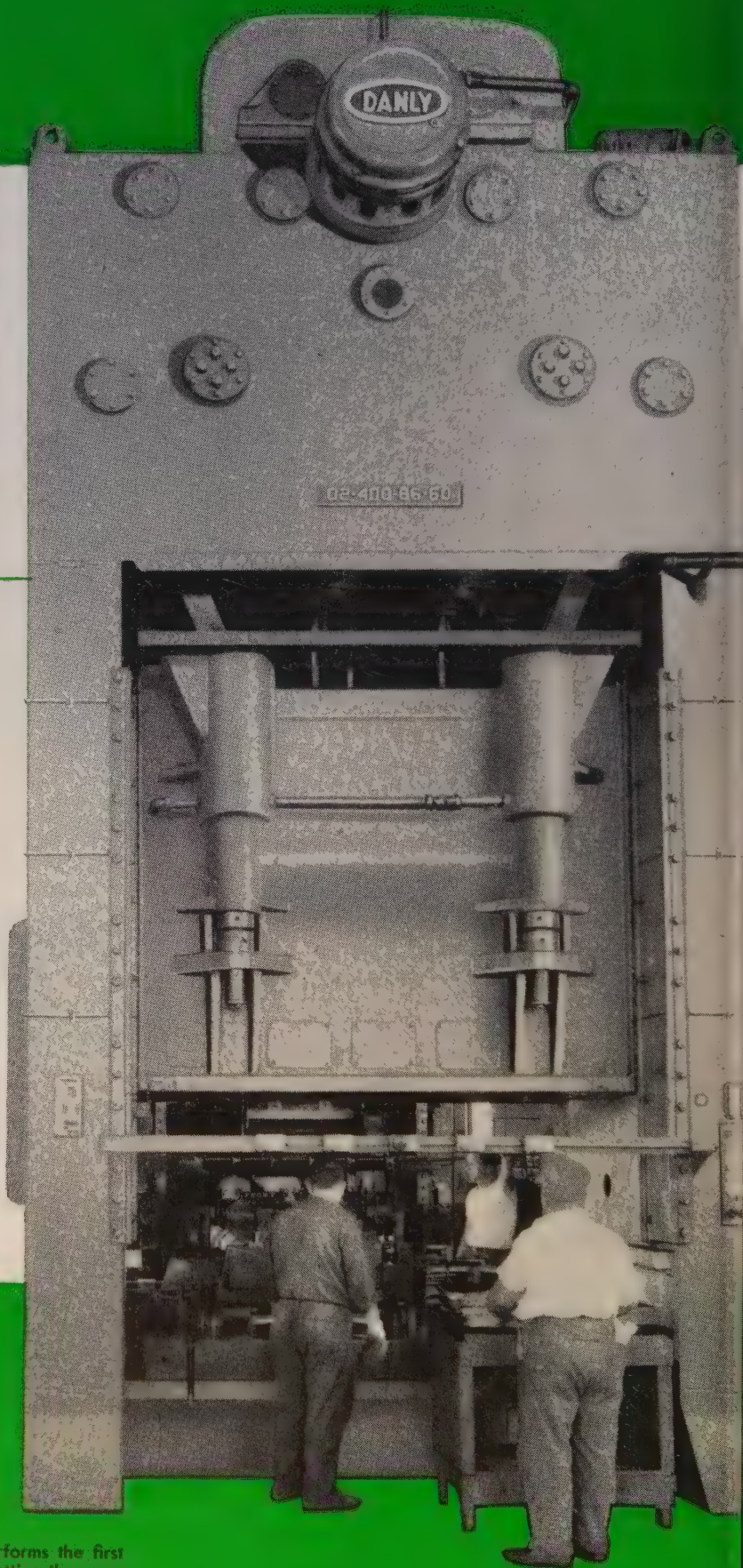
GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U. S. A.

Send note on Company Letterhead for Speed Reducer Catalog 46

DANLY PRESSES

BUILT
TO BEAT
PRODUCTION
RECORDS!



HEADING THE LINE . . .

This 400-ton Danly Double Action Press performs the first drawing operations on a variety of pieces, setting the pace for the entire line. Clear access to the die area speeds die changing.

**...at the Marion Industries
Division of Motor Products
Corporation, Marion, Ohio**

Ability to meet emergency schedules . . . to keep running day after day under maximum load conditions . . . is built into every Danly Press. Exclusive design features like the Danly Cool-Running Clutch and extra rigid, precise construction throughout assure longer uninterrupted production runs—less down time for routine maintenance.

That's why you find more and more *complete lines* of Danly Presses in leading stamping plants like this. Smoother, quieter and easier to operate, Danly Presses are preferred by press room personnel too!

Call a Danly Engineer today and see how Danly Presses, engineered to meet your specific requirements, will make your press room more efficient.

DANLY MACHINE SPECIALTIES, INC.

2100 South Laramie Avenue
Chicago 50, Illinois

Mechanical Presses . . . 50 to 3000 tons



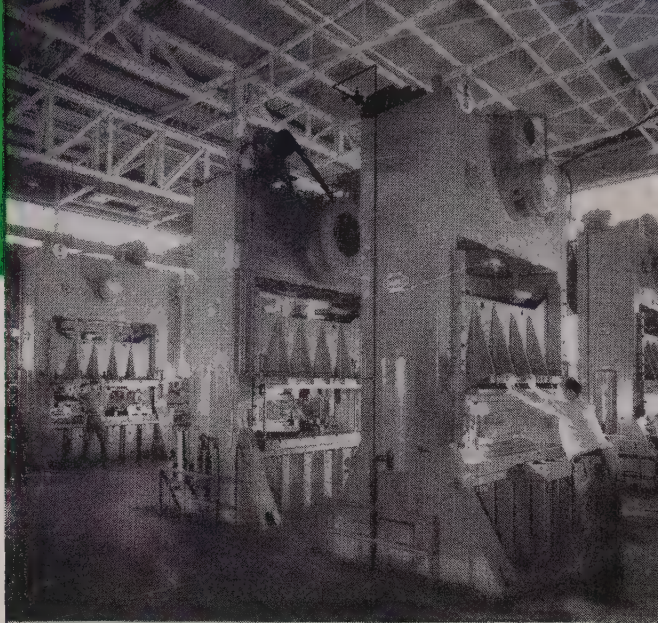
Straight Side

Autofeed

Gap Frame

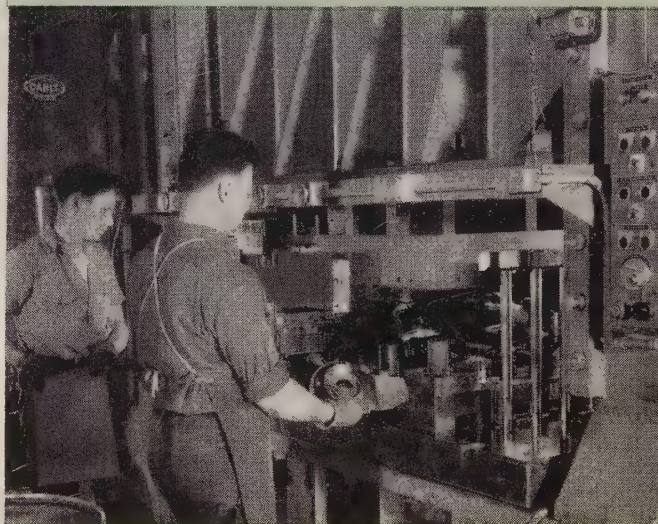
Double Action

Underdrive



PRODUCTION FLOW . . .

where a sequence of stamping operations is performed continuously on a line, each press is vitally important. Every press in the two lines shown here is a Danly.



EXTRA SAFETY . . .

Danly Press Controls protect operators and equipment too. Here, two operators independently feed separate dies in the same press with maximum safety. In this setup, it is required that each operator engage two run buttons during most of the down stroke before the press will complete the cycle.

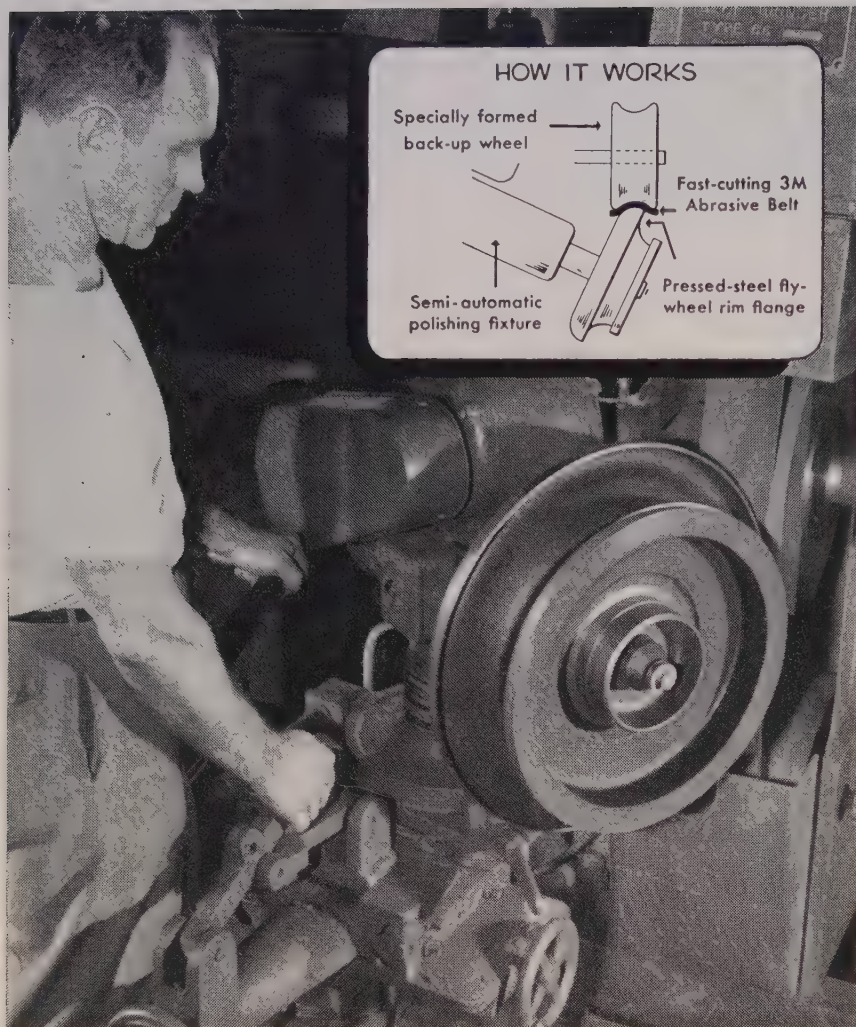


SEND FOR YOUR FREE
COPY OF THE NEW DANLY
DOUBLE ACTION CATALOG

TODAY!



IT COSTS LESS TO RUN A DANLY PRESS



SEMI-AUTOMATIC polishing fixture spins and turns 20" pressed-steel wheel against 3M belt. Back-up wheel is formed to mate with curve of flywheel flange.

"Formed-wheel" belt grinding cuts 3-step job to one!

**3M ABRASIVES SLASH GRINDING TIME
71% AT AMERICAN TYPE FOUNDERS**

Time study figures prove it! Formed back-up wheels and 3M Abrasives are saving American Type Founders \$1.15 on every "Little Giant" press flywheel they finish. A one-step operation now gives these wheels a smoother, cleaner surface in only 7½ minutes instead of 25 minutes with the former 3-step method, saving 71% on time alone.

Diagram above shows how formed back-up wheel matches the contour of the flywheel rim.

You can make savings in time

and money on *your* heavy grinding and finishing by consulting one of our experienced Methods Engineers. No obligation! Write Dept. S101 for this 3M consultation service.



Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Undersal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Adhesives. General Export: Minn. Mining & Mfg. Co., International Division, 270 Park Avenue, New York 17, N. Y. In Canada: Minnesota Mining & Mfg. Co. of Canada, Ltd., London, Canada.

which will triple electric power output on the continent. While interior areas of the country are largely uncultivated from an industrial standpoint, there is one blast furnace situated in the interior close by a rich ore deposit. Coal has to be brought in by rail, and iron ore is used as ballast on the return trip.

In the tertiary industry group the General Motors Holdens Ltd. automobile project is one of the most spectacular. An assortment of new plants furnishes practically every component going into the car, making it virtually a 100 per cent domestic product. Inflation has taken its toll on the price of the Holden, as in other countries, retail price having mounted from \$1100 to \$2000.

Friendly Hands Extended — Stack up the foregoing observations and opinions, along with many others too brief to be credited in detail yet often just as significant, and there appears a pattern applying not only to metallurgy in the free world but to all phases of metals production, fabrication and research. It might be high-spotted as follows:

1. Universal recognition of the top position of the U. S. in mass manufacturing, coupled with a keen desire to see and study operations in detail.

2. Acknowledgment of the short supply of many metals and alloys, with a somewhat lesser degree of concern than that observed in this country.

3. Willingness to share in what specialized knowledge there may be on the one side with the managerial talent there might be on the other.

4. A more leisurely and at the same time more thorough pace of research in European countries than is the rule here.

5. A consuming desire to be friendly and co-operative, plus an appreciation of the friendship reciprocated by the WMC hosts.

Fuel Systems Described

A compact and comprehensive bulletin is just off the press, illustrating and describing the complete line of McKee-Eclipse burners, mixers, valves and blowers used in gas combustion for industrial purposes. One page is also devoted to gas and oil-fired steam boilers and furnaces for the process industries. This pamphlet is designed to show the wide variety of the company's products, and the range of sizes in which each is obtainable. More detailed bulletins are available on each product, for those interested in specific equipment. Requests should be made direct to Eclipse Fuel Engineering Co., 1190 Buchanan St., Rockford, Ill.

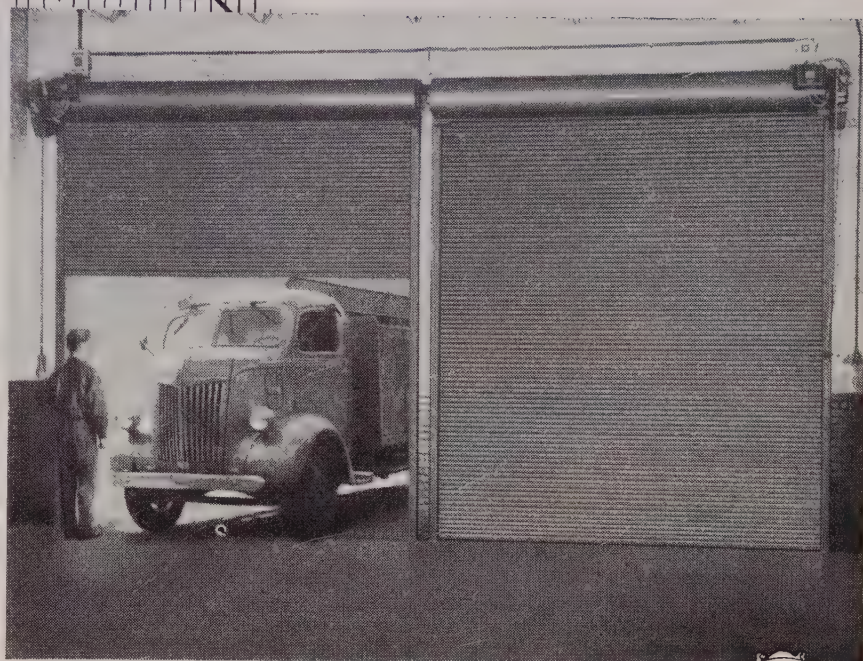
Metal Show Exhibitors

(Continued from Page 135)

	Booth No.
Blakeslee & Co., Cicero, Ill.	A250
Boice Crane Co., Toledo	A141
Bowser Inc., Ft. Wayne, Ind.	H416
Brainard Steel Co., Warren, O.	G151
Brown-Hutchinson Iron Works, Detroit	A149
Bruce Products Corp., Detroit	H223
Bruning Co. Inc., Chicago	F426
Brush Development Co., Cleveland	B147
Buck Tool Co., Kalamazoo, Mich.	C224
Buehler Ltd., Chicago	B131
Bundy Tubing Co., Detroit	D202
Cadillac Stamp Co., Detroit	H258
Cambridge Wire Cloth Co., Cambridge, Md.	C111
Carboloy Dept., General Electric Co., Detroit	F214
Casting Engineers Inc., Chicago	H324
Chicago Metal Hose Corp., Maywood, Ill.	C218
Chicago Rivet & Machine Co., Bellwood, Ill.	G214
Chicago Tramrail Corp., Chicago	H215
Chilton Co. Inc., New York	A256 & A138
Chrysler Corp., Detroit	G416
Cincinnati Milling Machine Co., Cincinnati	G356
Cities Service Oil Co., New York	D210
Clark Instrument Inc., Dearborn, Mich.	B143
Climax Molybdenum Co., New York	D250
Clinton Machine Co., Detroit	H546
Coast Metals Inc., Canton, O.	H426
Coles Cranes Inc., Chicago	F307
Commander Mfg. Co., Chicago	A159
Commercial Shearing & Stamping Co., Youngstown	D321
Commercial Steel Treating Corp., Detroit	D310
Composite Die Supply Co., Detroit	D112
Congress International des Fabrications Mecaniques	H519
Connors & Davis Sales Corp., W. Springfield, Mass.	H423
Continental Industrial Engineers Inc., Chicago	H345
Continuous Metalcast Corp., New York	G459
Crane Packing Co., Chicago	D242
Cro-Plate Co. Inc., Hartford, Conn.	G122
Crucible Steel Co. of America, New York	G310
Dake Engine Co., Grand Haven, Mich.	F416
Deepfreeze Distributing Corp., N. Chicago, Ill.	H254
Delaware Tool Steel Corp., Wilmington, Del.	C211
Delta Power Tool Div., Milwaukee	A319
Detrex Corp., Detroit	G351
Detroit Edison Co., Detroit	F461
Detroit Electric Furnace Div., Bay City, Mich.	A260
Detroit Stamping Co., Detroit	H306
Detroit Testing Machine Co., Detroit	B127
Diamond Iron Works Inc., Minneapolis	H236
Dieter Co., Harry W., Detroit	B244
Distillation Products Industries, Rochester, N. Y.	D236
Diversey Corp., Chicago	G346
Diversified Metal Products Co., Los Angeles	H224
DoAll Co., Des Plaines, Ill.	H305 & H406
Dow Chemical Co., Midland, Mich.	F222
Dow Furnace Co., Detroit	A349
Drever Co., Philadelphia	C229
Driver Co., Wilbur B., Newark, N. J.	A305
Du Pont de Nemours & Co., E. I., Wilmington, Del.	F356
East Shore Machine Co., Cleveland	H111
Eastman Kodak Co., Rochester, N. Y.	D236



COSTS ROLL DOWN



When KINNEAR DOORS Roll Up



*They save
SPACE*

— by opening straight up and coiling above the doorway, allowing floor and wall space around the door to be used at all times.

*They save
TIME*

— with smooth, easy gliding action. With motor operation, doors can be motor controlled from any number of conveniently located push-buttons.

*They save
MONEY*

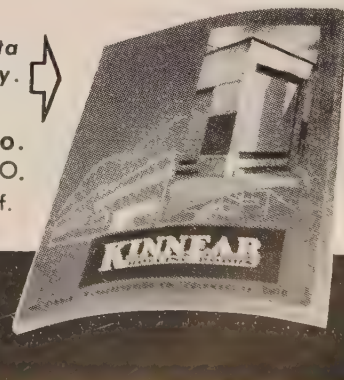
— rugged, all-steel, interlocking slat curtain assures long life, low maintenance, and extra protection against fire, intrusion and wind damage.


Every Kinnear door is specially fitted to the individual opening, in old or new buildings. Cannot interfere with traffic or other plant activity. When opened, it stays neatly above lintel, out of reach of damage. The Kinnear door's capacity for years of hard, uninterrupted use under the most difficult conditions has been proved by a half century of service.

Let Us Send You The New Kinnear Data Book. Write For Your Copy Today.

The KINNEAR Manufacturing Co.
Factories: 1780-1800 Fields Ave., Columbus 16, O.
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and agents in all principal cities

Saving Ways in Doorways
KINNEAR
ROLLING DOORS






METAL CUTTING
BAND SAWS

Regular—Skip Tooth
Spring Temper


INSERTED
TOOTH
SAWS



SOLID TOOTH SAWS



SEGMENTAL
TYPE SAWS



(All 3 Types of Saws
Also Furnished with Carbide Tips)

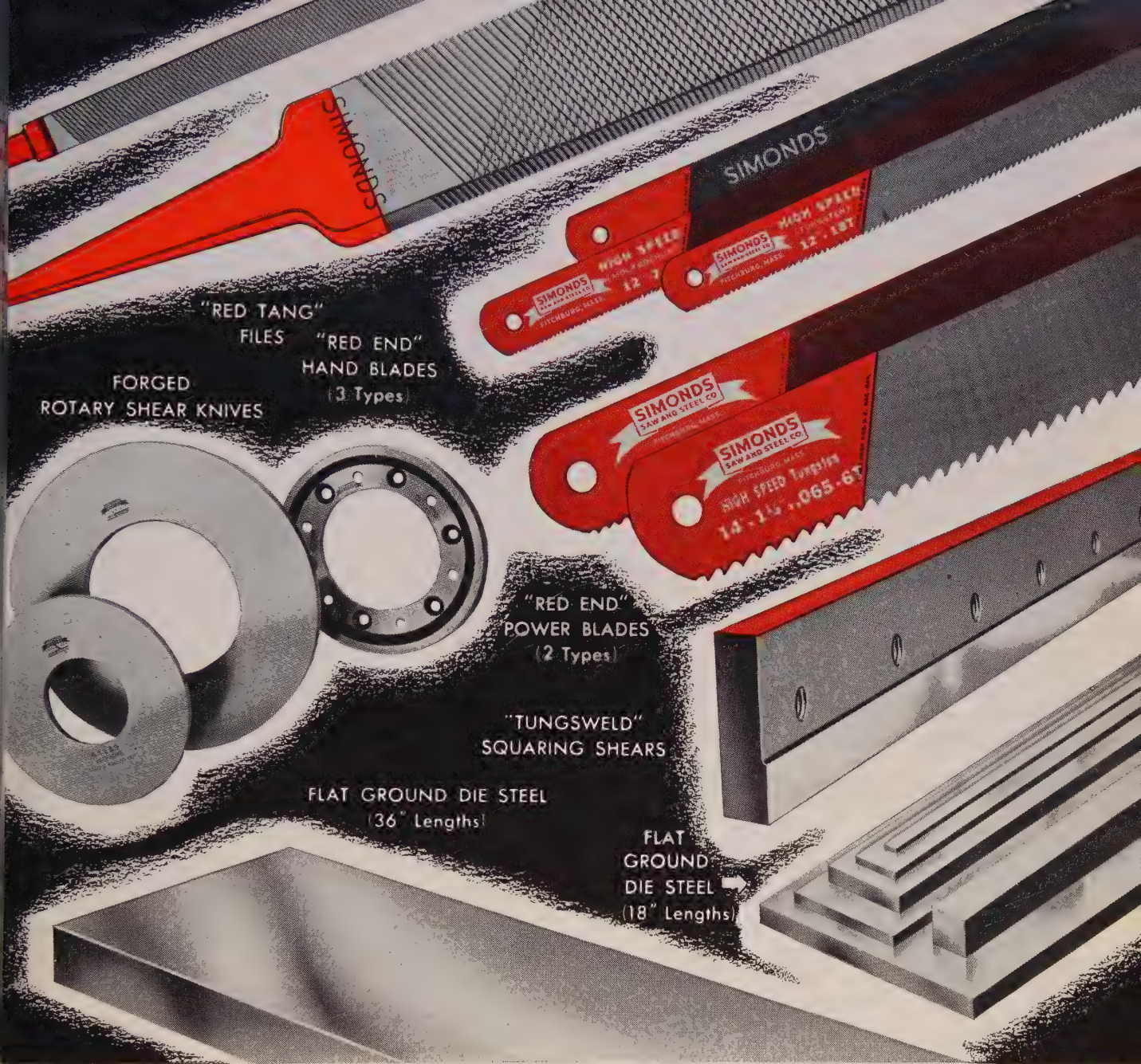
If You Cut Metal
CUT MORE
with
SIMONDS
Industrial Line

Over 100 years devoted to the ideal of developing the foremost line of cutting tools in this country... that's what underwrites every purchase you make of any product in the Simonds Line.

And don't forget this: You get 100% Simonds Quality Control beginning with steels processed from Simonds own steel mill... and going all the way through Simonds famous Windowless Process (first in this country).

Here, in this completely controlled-conditions plant, modern straight-line production methods

The Simonds Line is



plemented by special equipment
to produce cutting tools of *one quality only* . . . Simonds TOP Quality.
And you can bank on it that
these Simonds Tools will deliver
top performance on *any job* . . .
from hand filing and hacksawing,
to production machine cutting with
saws of all types and sizes. So, if
low-cost and high-level production
are vital to you . . . then specify
"Simonds" to your distributor or
dealer on any requirement you may
have on which the tools shown
above will serve.

Remember: *You start to save, the
minute you say SIMONDS!*

SIMONDS
SAW AND STEEL CO.

FITCHBURG, MASS.

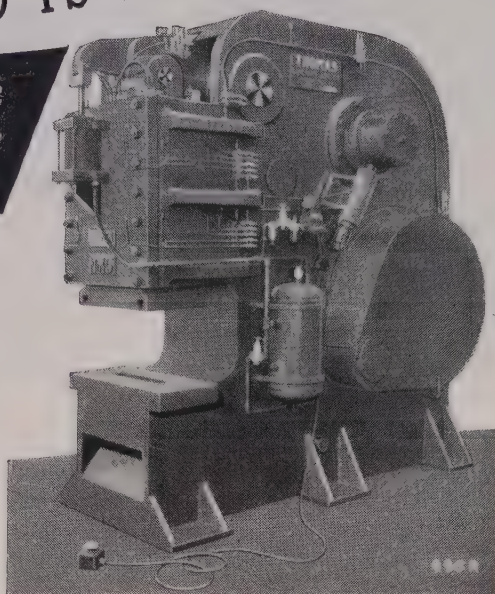
*Branch Offices in Boston, Chicago, San Francisco and
Portland, Ore. Canadian Factory in Montreal, Que.*

the Production Line

THE TREND IS TO THOMAS

*because of these
plus features!*

- Steel Plate Housing
- + Cast Steel Cut Gearing
- + Cast Steel Moving Parts
- + Air Operated Clutch
- + Air Counterbalance
- + Quick Tool Changes



This Thomas All-Steel Punch or Shear has shearing or punching attachments which may be interchanged in a matter of minutes

**For rounds, squares, flats,
angles or channels**

THOMAS
MACHINE MANUFACTURING COMPANY

PITTSBURGH (23), PA.

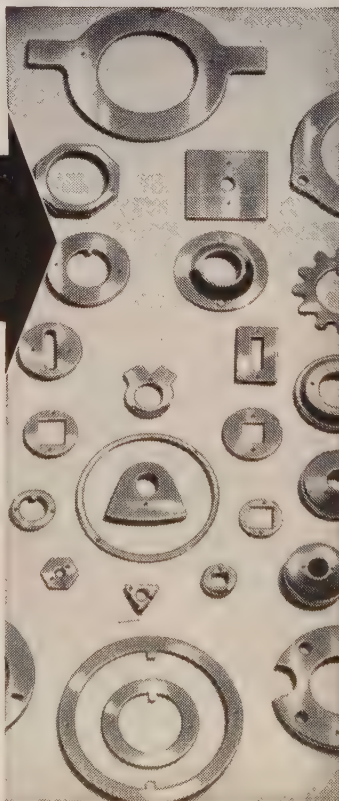
PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

Since 1887

**MILWAUKEE
WROT WASHERS**

Better
WASHERS
... Competitively Priced

Large volume production, the most advanced methods and facilities, plus more than 60 years of continuous experience in the manufacture of Washers, are factors that enable us to offer you top quality washers and stampings at competitive costs. Over 22,000 sets of dies for making Washers of every type (Standard and Special), from every type of material, for every purpose, in any finish. STAMPINGS of all descriptions; Blanking, Forming, Drawing. *Submit your blue-prints and quantity requirements for estimates.*



**WROUGHT WASHER
MANUFACTURING CO.**

The World's Largest Producer of Washers

2103 S. BAY ST., MILWAUKEE 7, WIS.



Booth No.

Eaton Mfg. Co., Massillon, O.	H357
Eclipse Fuel Engineering Co., Rockford, Ill.	G162
Elastic Stop Nut Corp. of America, Union, N. J.	D223
Eldorado Mining & Refining Ltd., Ottawa, Canada	H118
Electric Furnace Co., Salem, O.	F405
Electric Products Co., Cleveland	H202
Electro Arc Mfg. Co., Detroit	H508
Elgin National Watch Co., Elgin, Ill.	H235
Elox Corp., Clawson, Mich.	G239
Empire Products, Inc., Cincinnati	H520
Engelhard Industries, Newark, N. J.	A363
Engis Equip. Co., Chicago	B223
Ercona Corp., New York	B243
Erico Products Inc., Cleveland	H158
Eutectic Welding Alloys Corp., New York	F403
Fahralloy Co., Harvey, Ill.	H151
Fawick Airflex Co. Inc., Cleveland	G251
Ferner Co. Inc., R.Y., Boston	B218
Firth-Sterling Steel & Carbide Corp., Pittsburgh	G446
Fiske Brothers Refining Co., Newark, N. J.	C232
Freedom-Valvoline Oil Co., Freedom, Pa.	H244
Frontier Bronze Corp., Niagara Falls, N. Y.	B203

Galileo Corp. of America, Inc., New York	B138
Gas Appliance Service Inc., Chicago	G158
Gehring & Forsyth, Detroit	D140
General Alloys Co., Boston	A336
General Aniline & Film Corp., New York	G451
General Controls Co., Glendale, Calif.	G164
General Electric Co., Schenectady, N. Y.	A102
General Electric X-Ray Corp., Milwaukee	F250
General Plate Co., Attleboro, Mass.	D109
Goodrich Co., B. F., Akron	C212
Gordon Co., Claud S., Chicago	H352
Graham Mfg. Corp., Ferndale, Mich.	H257
Gray-Grimes Tool Co., Detroit	H154
Gulf Oil Corp., Pittsburgh	D230

H. & H. Research Co., Detroit	A205
H. & H. Tube & Mfg. Co., Detroit	D314
Hammond Machinery Builders Inc., Kalamazoo, Mich.	F211
Hanchett Magna-Lock Corp., Big Rapids, Mich.	H120
Handy & Harman, New York	F315
Harnischfeger Corp., Milwaukee	G415
Harper Electric Furnace Corp., Buffalo	C204
Harshaw Chemical Co., Cleveland	A220
Haynes Stellite Co., Kokomo, Ind.	F440
Heintz Mfg. Co., Philadelphia	A339
Heli-Coil Corp., Danbury, Conn.	A154
Heppenstall Co., Pittsburgh	C122
Hevi Duty Electric Co., Milwaukee	D350
Higbie Mfg. Co., Rochester, Mich.	C237
Hilger, Ltd., Adam, London	B146
Hitchiner Mfg. Co. Inc., Manchester, N. H.	H264
Hobart Brothers Co., Troy, O.	D138
Holcroft & Co., Detroit	G245
Holden Co., A. F., Detroit	F406
Hones Inc., Charles A., Baldwin, N. Y.	G265
Hoskins Mfg. Co., Detroit	F217
Houghton & Co., E. F., Philadelphia	F306
Howard Foundry Co., Chicago	C138

Illinois Testing Laboratories Inc., Chicago	B224
Industrial Cable & Sling Co., Detroit	H251
Industrial Heating Equipment Co., Detroit	D320
Industrial Press, New York	H128

STEEL

\$10,000 SAVED in one year

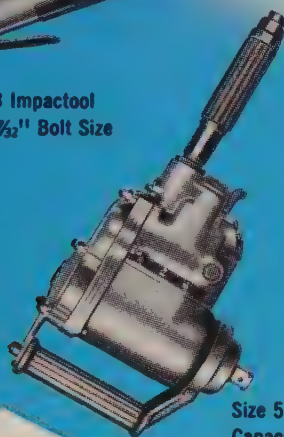
with **ROTARY AIR**
 **IMPACTTOOLS**



Size 504 Impacttool
Capacity $\frac{3}{8}$ " Bolt Size



Size 500B Impacttool
Capacity $\frac{7}{32}$ " Bolt Size



Size 538 Impacttool
Capacity $1\frac{1}{2}$ " Bolt Size



Size 534 Impacttool
Capacity $1\frac{1}{4}$ " Bolt Size



Size 588 Impacttool
Capacity 4" Bolt Size

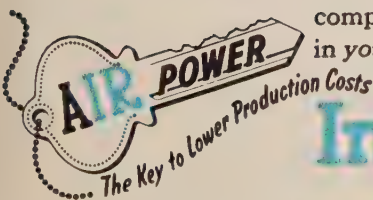
Shown here are representative sizes from the complete line of I-R

Air Impacttools designed to meet all nut-running requirements.

A mid-western manufacturer of materials handling equipment saved \$10,000 in one year by installing Ingersoll-Rand Air Impacttools on an idler assembly nut running job in his plant. The installation of the Impacttools and accessory equipment cost \$1200, which quickly paid for itself in 33 days!

Similar time and labor savings can be made in your plant, on your jobs. Air Impacttools are available in thirteen sizes to handle nut running jobs up to 4" bolt size. The smallest Impacttool, for work up to $\frac{7}{32}$ " bolt size, weighs only $1\frac{3}{8}$ pounds; the twelve larger sizes are correspondingly packed with top power per pound.

You get no tiring and wasteful kick or twist with an Impacttool . . . full power is delivered to the work . . . quickly running up or removing nuts and screws. Ingersoll-Rand, *originator of Impacttools*, has manufactured these sturdy and reliable machines for 18 years. Today they are in use in thousands of plants around the world, saving countless dollars and hours. Call, write, or wire your Ingersoll-Rand branch office—an Air Power Specialist will be glad to give you complete details, or arrange an eye-opening, dollar-saving trial or demonstration in your plant.



Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

661-8

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO-BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL & GAS ENGINES



186

Metals & Controls Corp., Attleboro, Mass.	D109
Metals Finishing Corp., Hazel Park, Mich.	H526
Michiana Products Corp., Michigan City, Indiana ..	A312
Michigan Bell Telephone Co., Detroit ..	F401
Michigan Industrial Gas Corp., Detroit ..	H210
Michigan Steel Casting Co., Detroit ..	G409
Miller & Taylor Tool Co., Cleveland ..	G456
Milne & Co., A., New York ..	A356
Mir-O-Col Alloy Co. Inc., Los Angeles ..	A316
Modernair Corp., San Leandro, Calif.	H315
Morton Gregory Corp., Toledo, O.	G202
Mueller Brass Co., Port Huron, Mich.	H241
Multifinish Mfg. Co., Detroit ..	H247
National Cored Forgings Co. Inc., S. Norwalk, Conn.	F254
National Cylinder Gas Co., Chicago ..	G112
National Diamond Laboratory, New York ..	C210
National Industrial Publishing Co., Pittsburgh ..	C239
National Lead Co., New York ..	F449
National Radiator Co., Johnstown, Pa.	H109
National Research Corp., Cambridge, Mass.	A309
National Spectrographic Laboratories, Cleveland ..	B146
National Time & Signal Corp., Detroit ..	B238
National Torch Tip Co., Pittsburgh ..	H148
Nelson Stud Welding Division, Lorain, O.	G202
New Hermes Engraving Machine Corp., New York ..	H108
New Jersey Zinc Co., New York ..	A162
Niagara Blower Co., New York ..	G422
North American Philips Co. Inc., New York ..	A220
Nox-Rust Chemical Corp., Chicago ..	H417
Oakite Products Inc., New York ..	D309
Office Technique Pour L'Utilisation De L'Acior, Paris, France ..	H521
Ohio Crankshaft Co., Cleveland ..	G246
Ohio Overall Cleaning Co., Cleveland ..	D303
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.	D216
Opplen Co., New York ..	B138
Osborn Mfg. Co., Cleveland ..	D118
Ozalid Division, Johnson City, N.Y.	G451
Pangborn Corp., Hagerstown, Md.	G421
Park Chemical Co., Detroit ..	F456
Parker Rust Proof Co., Detroit ..	H339
Peabody Industries, New York ..	H214
Penton Publishing Co., Cleveland ..	G340
Peters-Dalton Co., Detroit ..	G355
Phillips Mfg. Co., Chicago ..	A355
Physicists Research Co., Ann Arbor, Mich.	D135
Picker X-Ray Corp., New York ..	F411
Powdered Metal Products Corp. of America, Franklin Park, Ill.	A118
Power Ball Oil Co. of Michigan Inc., Detroit ..	A105
Precision Metalsmiths Inc., Cleveland ..	B123
Precision Spring Corp., Detroit ..	A214
Precision Welder & Machine Co., Cincinnati ..	H364
Product Engineering & Mfg. Corp., Bridgman, Mich.	H221
Production Machine Co., Greenfield, Mass.	F225
Pyrometer Instrument Co. Inc., Bergenfield, N.J.	B108
RCS Tool Sales Corp., Joliet, Ill.	H316
Radio Corp. of America, Camden, N.J.	D324
Ransburg Electro-Coating Corp., Indianapolis ..	G445
Rapids-Standard Co., Grand Rapids, Mich.	H121



In this modern plant

skilled craftsmen, modern equipment and scientific controls all combine forces to produce strip steel of consistently uniform quality. Wallingford uniformity means that gage, temper and surface are in all ways and at all times the same. Edges are always smooth and straight, surfaces uniformly clean and flat, widths consistently exact. This uniform quality means savings in preparation time and smoother, faster operation to cut down machine stoppages and minimize rejects.

THE WALLINGFORD STEEL CO.

WALLINGFORD, CONNECTICUT, U.S.A.

LOW CARBON • HIGH CARBON

ALLOY • STAINLESS • STRIP and TUBING

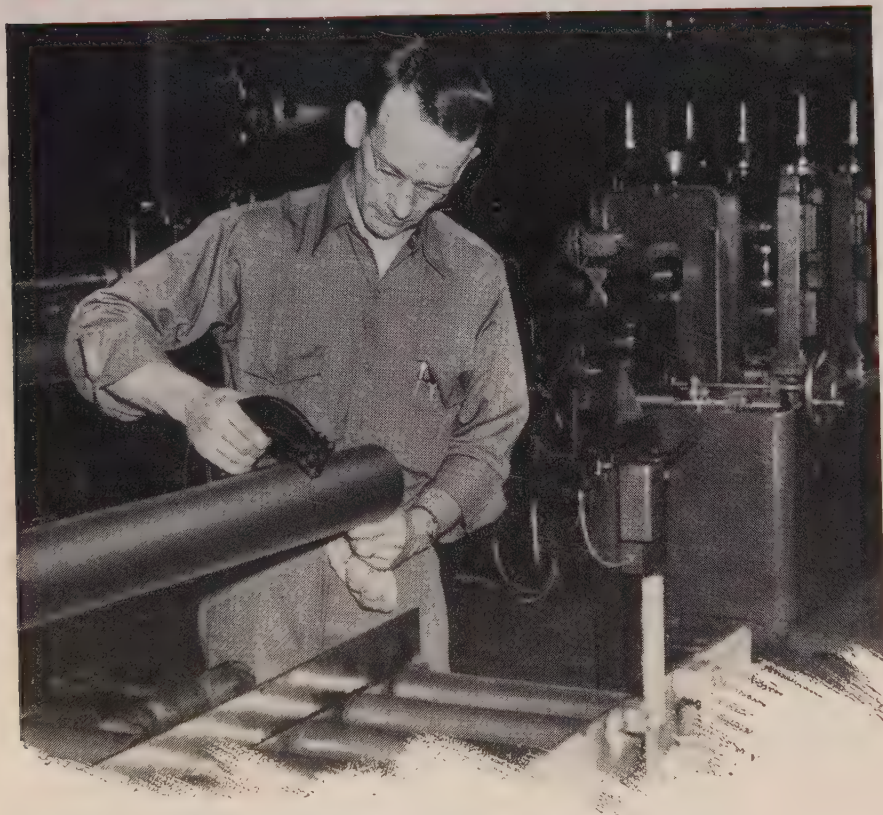


	Booth No.
Raytheon Mfg. Co., Waltham, Mass. . .	A255
Ready-Power Co., Detroit . . .	G131
Reeves Pulley Co., Columbus, Ind. . .	A350
Reliance Electric & Engineering Co., Cleveland . . .	A360
Reynolds Metals Co., Louisville . . .	F325
Richards Co., J. A., Kalamazoo, Mich. . .	H152
Riehle Testing Machines Div., East Moline, Ill. . .	B246
Robotron Corp., Detroit . . .	H535
Rockwell Mfg. Co., Milwaukee . . .	A319
Rolock Inc., Fairfield, Conn. . .	D140
Ross Operating Valve Co., Detroit . . .	B232
Safety Clothing & Equipment Co., Cleveland . . .	G462

	Booth No.
Sales Service Machine Tool Co., St. Paul . . .	A219
S. & S. Machinery Co., Brooklyn, N.Y. . .	G330
Schenck, Carl, Darmstadt, Germany . . .	B218
Schrader's Son, A., Brooklyn, N.Y. . .	G309
Sciaky Bros., Inc., Chicago . . .	G318
Scott Inc., C. U. & Son, Rock Island, Ill. . .	H243
Scovill Mfg. Co., Waterbury, Conn. . .	G459
Seal-Peel Inc., Van Dyke, Mich. . .	A320
Selas Corp. of America, Philadelphia . .	G148
Sentry Co., Foxboro, Mass. . .	A109
Service Diamond Tool Co., Ferndale, Mich. . .	G117
Sheldon Machine Co. Inc., Chicago . . .	A155
Sinclair Refining Co., Chicago . . .	H358
Smith Corp., A. O., Milwaukee . . .	H524

	Booth No.
Smith Welding Equipment Corp., Minneapolis . . .	A208
Socony-Vacuum Oil Co. Inc., New York . .	G221
Solventol Chemical Products Inc., Detroit . . .	A202
Sonoflux Corp., Houston . . .	H146
Sparkler Mfg. Co., Mundelein, Ill. . .	A218
Special Libraries Association— Metals Section . . .	H424
Spencer Turbine Co., Hartford, Conn. . .	G260
Sperry Corp., New York . . .	G109 & D115
Standard Alloy Co., Cleveland . . .	D140
Standard American Engineering Co., Lyons, Ill. . .	D110
Standard Diemakers Supplies, Detroit . .	H328
Standard Electrical Tool Co., Cincinnati .	G210
Standard Oil Co. of Indiana, Chicago . .	D130
Standard Steel Treating Co., Detroit . .	H139
Standard Tube Co., Detroit . . .	A216
Starrett Co., L. S., Athol, Mass. . .	C123
Steel City Testing Machines Inc., Detroit . . .	G220
Stevens Inc., Frederic B., Detroit . . .	D330
Stokes Machine Co., F. J., Philadelphia . . .	A158
Stone Machinery Co., Syracuse, N.Y. . .	A359
Stuart Oil Co., Ltd., D. A., Chicago . . .	A266
Sunbeam Corp., Chicago . . .	F256
Surface Combustion Corp., Toledo, O. . .	F240
Syntron Co., Homer City, Pa. . .	H135
Tempil Corp., New York . . .	C117
Tennant Co., G. H., Minneapolis . . .	H530
Texas Co., New York . . .	C103
Tincher Products Co., Sycamore, Ill. . .	C228
Tinnerman Products Inc., Cleveland . . .	C207
Tin Research Institute Inc., Columbus, O. . .	B236
Tracerlab Inc., Boston . . .	B118
Trent Tube Co., E. Troy, Wis. . .	G310
Trerice Co., H. O., Detroit . . .	B245
Tri-Clover Machine Co., Kenosha, Wis. . .	H346
Uddeholm Co. of America, New York . .	B116
Udylite Corp., Detroit . . .	D330
Union Carbide & Carbon Corp., New York . . .	F440
United Chromium Inc., New York . . .	B132
U. S. Air Force—Materials Research, Dayton, O. . .	H136
U. S. Electrical Motors Inc., Los Angeles . . .	D302
U. S. Gypsum Co., Chicago . . .	H143
Universal Castings Corp., Chicago . . .	G115
Universal-Cyclops Steel Corp., Bridgeville, Pa. . .	F247
Univerlital Machine Co., Detroit . . .	H348
Upton Electric Furnace Co., Detroit . .	C102
Vanadium-Alloys Steel Co., Latrobe, Pa. .	D345
Vapofier Corp., Chicago . . .	C109
Vickers Inc., Detroit . . .	G109
Vlier Mfg. Co., Los Angeles . . .	B204
Walder-Scott Inc., Detroit . . .	G101
Walker-Turner Div., Plainfield, N.J. . .	A240
Wall Colmonoy Corp., Detroit . . .	C243
Webber Appliance Co. Inc., Indianapolis . . .	H248
Weldit Inc., Detroit . . .	H545
Wells Mfg. Co., Three Rivers, Mich. . .	D209
Wells, W. F. & Sons, Three Rivers, Mich. . .	H117
Weltronic Co., Detroit . . .	D224
Western Sealant of Detroit Inc., Detroit . . .	C118
Westinghouse Electric Corp., Pittsburgh .	G430
Weston Electrical Instrument Co., Newark, N.J. . .	B227
Wheelco Instruments Co., Chicago . . .	D219
Wilson Carbon Co., New York . . .	B220
World Raw Materials Congress . . .	H519
Worthington Pump & Machinery Co., Harrison, N.J. . .	G455
Wynn Oil Co., Milford, Mich. . .	H124

HOW TUBING TOLERANCES ARE CHECKED AT BRAINARD...



OUTSIDE DIAMETER, INSIDE DIAMETER,
gage, ovality, straightness—all tolerances are checked over and over again at Brainard to make sure sizes are perfect for the job ahead. Every order, large or small, gets the careful supervision of Brainard craftsmen—we have complete control of every operation from ore to tube. That's why it will pay you to call on Brainard first when you have a job for electric welded mechanical tubing. Straight or fabricated. Sizes ½" to 4"—.025 to .165.

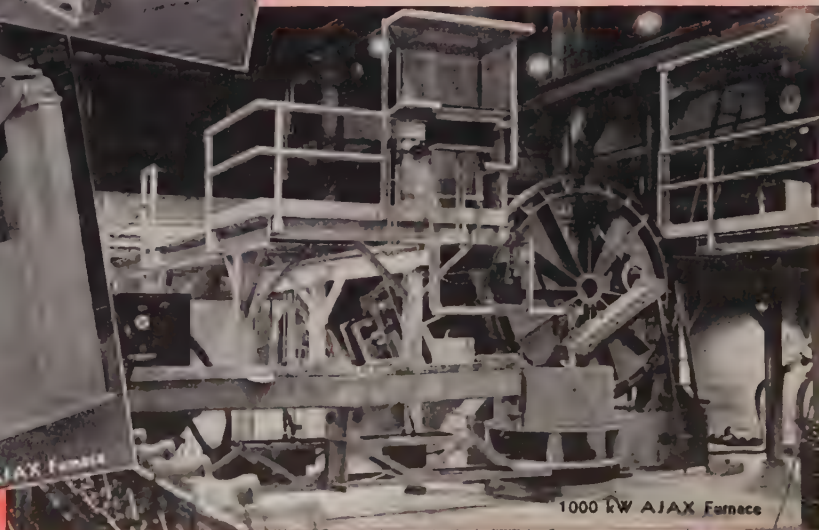
Sales offices: Atlanta, New York, Cincinnati, Pittsburgh, Buffalo, Chicago, Philadelphia, Dearborn, Cleveland, Tonawanda, N.Y., Rochester, Indianapolis, Nashua, N.H. Sales representatives: Sharonsteel Products Co., Dearborn, Mich., Grand Rapids, Mich. and Farrell, Pa. Fred J. Reynolds, Davenport, Iowa. Brass & Copper Sales Co., St. Louis, Mo. and Kansas City, Kan. Julius Schulz, Dallas, Texas.



Yes! AJAX Induction Melting Furnaces are Versatile!



For many years AJAX has been the pioneer in the development of standard frequency induction furnaces for melting metals. To-day this type of equipment has been adapted to the full range of non-ferrous metals and alloys and to a great variety of sizes ranging from 20 to 1000 kW.



AJAX Induction Melting Furnaces are now used for the following applications: Die Castings, Permanent Mold Castings, Sand Castings, Billets for Rolling and Extrusion, Recovery of Scrap, Galvanizing and Aluminizing of Steel and many others.

For special applications an Automatic Elec-

tromagnetic Pump allows continuous feeding of molten metal into the molds as they move past. Hand ladling is eliminated. Temperature of course is also automatically controlled and there is no chance of overheating the bath at any time during the melting cycle.

WRITE FOR FURTHER INFORMATION

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX

TAMA-WYATT



INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax-Hullgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Jet blades cleaned and rust protected in one spray washer

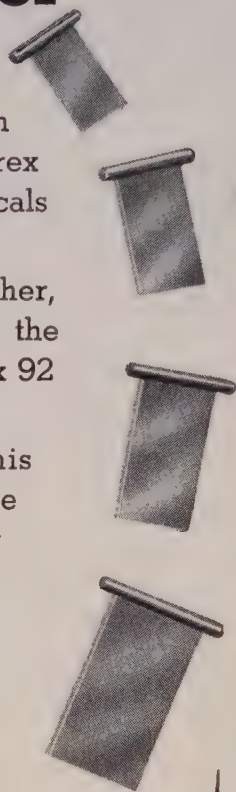
Teamwork between chemicals and equipment is paying off for a midwestern manufacturer of jet engine parts. A Detrex washer is teamed with two Detrex chemicals for a 2-in-1 operation.

Detrex 53, in the first stage of the washer, removes oil, grease and shop dirt. In the second stage, a low concentration of Detrex 92 retards rust.

Proof of "customer satisfaction"—this manufacturer is now installing five more Detrex washers and degreasers for other cleaning operations in the manufacture of the jet blades.

You, too, can benefit by working with a company that is familiar with every phase of metal cleaning . . . a company long experienced in the manufacture of both cleaning compounds and equipment.

Metal cleaning know-how thru a Detrex field engineer is yours free for the asking.



Technical Advances Revealed at AISE Meeting

TECHNICAL papers presented at the annual convention of the Association of Iron & Steel Engineers, Hotel Sherman, Chicago, Oct. 1-4, offer a well-rounded coverage of the latest developments in the iron and steel industry. The four-day program with morning and afternoon sessions dealing with electrical units, combustion, mechanics, operating practice, standardization and lubrication incorporates a total of 42 subjects. A digest of some of the papers follows.

Combustion Gas Turbines and the Steel Industry, by W. B. Wilson, application engineer, Industrial Power Division, General Electric Co., Schenectady, N. Y.

The combustion gas turbine is an important new tool for the power engineer in the iron and steel industry. This industry is a large user of electric power and often supplements power purchased from the utility with power generated within the mill. Power generation within the mill becomes more attractive, of course, when low-cost by-product fuel can be utilized.

Simplicity, low first cost and expected low maintenance and operating costs of combustion gas turbines make them applicable in many mills where power generation is considered. They can be used for power generation, for blower drive, or for other mechanical drive applications.

This paper discusses the types of combustion gas turbines for various applications with particular attention to possible applications in the iron and steel industry. Ratings, fuels and performance data are given for the different types of units.

Flash Welding and High Speed Cold Reduction of Strip Steel for Tin Plate, by John Wargo, assistant tin plate metallurgist, and Ray C. Brunner, development engineer, Jones & Laughlin Steel Corp., Aliquippa, Pa.

Economic value of a high speed mill can only be realized when such a mill is able to roll consistently a product of commercial quality at or near its rated capacity. Excessive delay time or too frequent operation at speeds below those for which the mill was developed and powered, defeat the purpose of high speed rolling, and production when measured quantitatively is comparable to slower conventional mills.

One of the disadvantages in operating a high speed mill is the nec-

110



DETREX

BOX 501, DETROIT 32, MICH.

Corporation

HOT FORMULA!

$$RF = LC + BP - R$$

Puts The Heat On Parts Production at Oliver

RF = LC + BP - R means: Radio Frequency heating equals Lower Costs plus Better Product minus Rejects . . . and here's how this formula paid off for the Oliver Corporation, Charles City, Iowa.

Oliver needed a heat treating process flexible enough to handle 15 different parts, ranging from 1/2 inch sleeves, lever arms and valve seats to long shafts. The hardening operation, requiring as many as 10 daily set-ups, had to supply varied parts of consistently high quality, or production would be delayed.

Oliver installed a 50 KW-450 KC RF Generator and work-handling equipment, all Westinghouse-built, which easily handled all parts, and required only about 10 minutes of an unskilled operator's time for changing set-ups. The RF induction heating process drastically cut costs 43%, and there were *no* rejects—with the net result that Oliver is able to produce a better tractor faster and cheaper.

See how this formula—or one of its many variations—has solved the heating problems of other manufacturers—problems that may parallel your own. Write for case history booklet, B-4782, Westinghouse Electric Corporation, Dept. S22, 2519 Wilkens Avenue, Baltimore 3, Md.

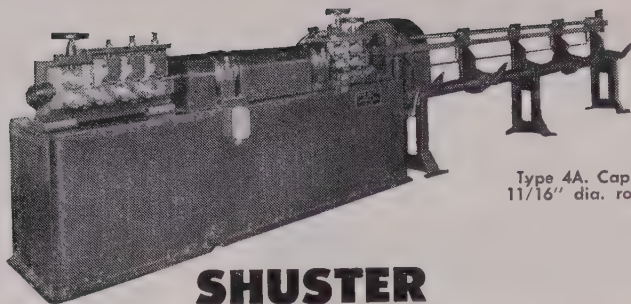
J-02233

YOU CAN BE SURE...IF IT'S

Westinghouse



INDUCTION HEATING



Type 4A. Cap. 3/8"–
1 1/16" dia. round wire

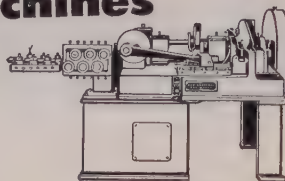
SHUSTER Wire Straightening Machines

are noted for their extremely fast production; greater cutting speeds that deliver square-cut, undistorted ends; and for their rigid, wear-resisting construction.

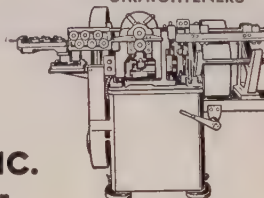
Mfd. by **METTLER MACHINE TOOL, INC.**

132R Lawrence St., New Haven, Conn.

Representatives in all principal cities and in foreign countries.



SLIDE FEED
STRAIGHTENERS



FLAT STOCK
STRAIGHTENERS

SHUSTER

Since 1866

Automatic

WIRE STRAIGHTENING
AND CUTTING MACHINES

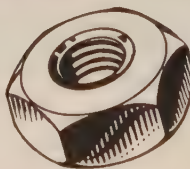
Be Double-Sure

ATLAS HEXAGON NUTS

**...are Double Chamfered,
Double Counter-Sunk**

You make double savings, too, with Atlas hexagon nuts. They require far less time and labor, cut costs, because Atlas nuts are double chamfered, double counter-sunk, free of burrs. Also large stock of bolts, screws and washers—steel, brass, stainless—available for immediate delivery. • ATLAS also offers facilities for the manufacture of special component parts.

For prompt quotations, submit your requirements, giving details, specifications and delivery dates.



AT-117A

ATLAS SCREW & SPECIALTY CORP.

450 BROOME STREET • NEW YORK 13, N. Y.

essity (because of size limitations in the steelmaking and rolling prior to pickling) of entering into the mill build-up coils containing several welds. Reduction of speed when the welds are rolled, or weld breakage with the possibility of damage to work rolls which might require their removal from one or more stands, can be a serious detriment in attaining the mill's production potential.

The ability to weld strip steel and roll the welds at speed on the cold mill has been and continues to be a very important requirement for successful mill performance. Flash butt welding of hot bands by the electrical resistance method is performed at the Aliquippa works by a hydraulic type machine specifically designed for this purpose. Since the strip is not subject to any considerable variations in cross-sectional area or chemistry, the same general welding practice is maintained on all material welded. Strict adherence to a servicing schedule, particularly in respect to welding dies, has been found necessary for producing satisfactory welds. A sound weld if improperly trimmed is not suitable for cold rolling. To obtain a consistently uniform trim, the automatic weld flash trimmer has been altered from its original design.

Metallurgical Tips for the Maintenance Man, by Michael V. Herasimchuk, maintenance metallurgist, Bethlehem Steel Co., Bethlehem, Pa.

Solving problems on equipment failures is sometimes difficult for the maintenance man because the original metallurgical or engineering factors of design are seldom reviewed with him. To help him recognize when equipment failures are related to metallurgical or engineering principles, this paper presents field studies made on steel mill equipment. It shows how failures have been forestalled or eliminated and points out how the maintenance man is an important part of a research program.

Illustrations include (a) effective use of alloy steel, (b) effect and correction of inadequate design, (c) effect of improper welding practice, (d) effect and correction of improper heat treatment specifications. Further illustrations show how to combat effects of decarburization and stress raisers, and how to study tool wear problems. Emphasis is placed on the importance of relaying accurate information to both engineering and metallurgical departments.

Accurate Steel Mill Weighing, by K. A. Blom, corporation weighing supervisor, Republic Steel Corp., Cleveland.

Accurate and dependable weighing

**SOLID STEEL
HEADS, CAPS
and MOUNTINGS
MACHINED from
SOLID BAR
STOCK**

**HARD
CHROME PLATED
PISTON
RODS**

**DIRT
WIPER
SEALS**

**NON-CORROSIVE
BRASS BARRELS**



Benefits to You
No Broken Castings
No Scratch-Damage
to Piston Rods,
Bushings and Seals
NO COSTLY
"DOWNTIME"
NO REPAIRS
NO MAINTENANCE
NO POWER WASTAGE

AIR CYLINDERS

**Meet J.I.C.
PNEUMATIC
STANDARDS . . .**

(Write for **FREE** copy of these "Standards")

The four features illustrated above serve to show how Miller Air Cylinders *for years* have been meeting—even exceeding—the high quality set by the recently adopted J.I.C. Pneumatic Standards for Industrial Equipment. See for yourself! . . . write for our free bulletin A-105 and receive also your own *free* personal unabridged copy of these "Standards" with standard symbols, sample circuit, interesting point-by-point comparison—all neatly compiled into a handy booklet that fits your reference file and folds to fit your pocket.

COMPLETE MILLER CYLINDER LINE INCLUDES: AIR CYLINDERS, 1½" to 20" BORES, 200 PSI OPERATION; LOW PRESSURE HYDRAULIC CYLINDERS, 1½" TO 6" BORES FOR 500 PSI OPERATION, 8" TO 14" BORES FOR 250 PSI; HIGH PRESSURE HYDRAULIC CYLINDERS, 1½" TO 12" BORES, 2000-3000 PSI OPERATION. A MOUNTING STYLES AVAILABLE.



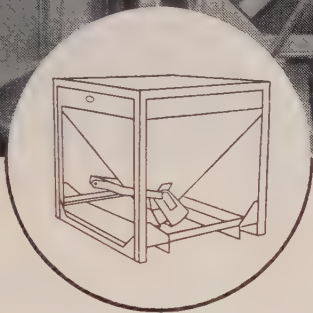
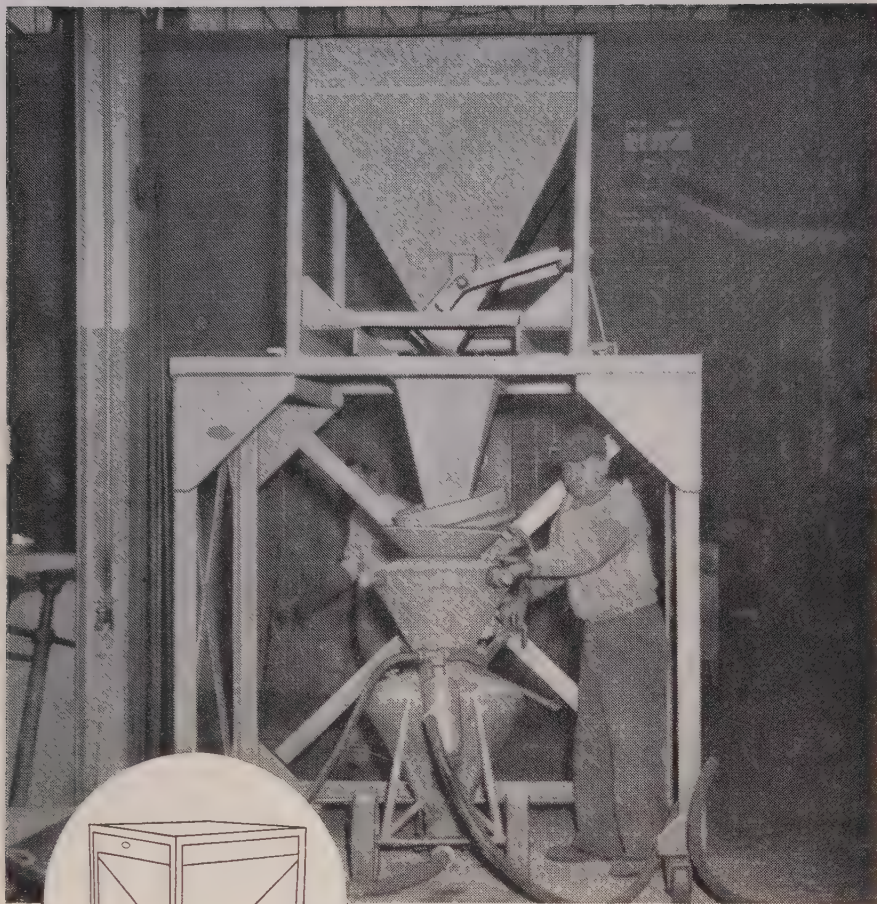
MILLER MOTOR COMPANY

2032 N. HAWTHORNE

MELROSE PARK, ILL.

AIR AND HYDRAULIC CYLINDERS • ACCUMULATORS • COUNTERBALANCE CYLINDERS • BOOSTERS • AIR HOSES

CLEVELAND — PITTSBURGH — PHILADELPHIA — DETROIT — YOUNGSTOWN — BOSTON
HARTFORD — NEW YORK CITY — DAYTON — ST. PAUL — FORT WAYNE — INDIANAPOLIS
MILWAUKEE — NASHVILLE — SEATTLE — LOS ANGELES — SAN FRANCISCO — BALTIMORE



Specially designed hopper bucket makes cupola lining more efficient. Bucket is placed on frame by use of a lift truck.

Solve Your Material Handling Problems With **PENN IRON SPECIAL EQUIPMENT**

In lining cupolas, Textile Machine Works foundry in Reading, Pennsylvania, had difficulty handling the clay mix used with their Bondactor equipment. After a study of the problem, Penn Iron Works, Inc., designed, engineered and manufactured this special hopper bucket for maximum handling efficiency.

Whatever the bulk-material handling problem in your plant, Penn Iron Works, Inc., will be glad to help with its solution. Our wide experience in designing and manufacturing all types of buckets and special handling equipment for foundries can help you cut costs . . . save time . . . increase efficiency.



For Further Information Write:

PENN IRON WORKS, INC.
READING, PENNSYLVANIA

is a matter of major importance, since a number of significant calculations are based on weights. In recognition of this fact, Republic Steel Corp. has instituted a weighing program designed to modernize and otherwise improve all major scale installations. The program is directed by a weighing committee appointed by management and consisting of representatives from all departments concerned.

Track scale checkweighing of out-bound products is eliminated. To establish close control of mill weighing, each steel producing district of the corporation employs a weighing supervisor whose sole duty it is to follow all phases of weighing within his respective district. Every shipping and many production scales have in the last three years been furnished with up-to-date, self-indicating recording dials, in an effort to eliminate human errors resulting from beam and poise weighing. Scales are tested regularly and any errors in excess of 2/10 of 1 per cent promptly corrected by a well-equipped scale repair force.

Special attention is being paid to scale repairs and maintenance, particularly preventive maintenance. Scale repair shops in each steel district have been properly equipped with all facilities required to repair any type of scale quickly and efficiently. In some of the larger districts a fully equipped scale service truck facilitates quick repairs.

Shock loading of scales is probably the most frequent cause of scale trouble. This practice results in broken levers, pivots, cut bearings or at the best in jarring knives and pivots off their bearings. To overcome this, Republic has through special arrangement with the manufacturer, introduced a specially designed flexure plate scale for mill weighing. Besides eliminating scale wear completely, this type scale offers greater resistance to shock through greater bearing surface and insures maximum stability of scale multiplication.

AC Power Distribution in Steel Mills, by D. L. Beeman, manager, Industrial Power Division, General Electric Co., Schenectady, N. Y.

Great strides have been made in the design of ac power systems in general, particularly for steel mills. The progress has been along two lines:

1. Improved system engineering.
2. Improved equipment for the systems.

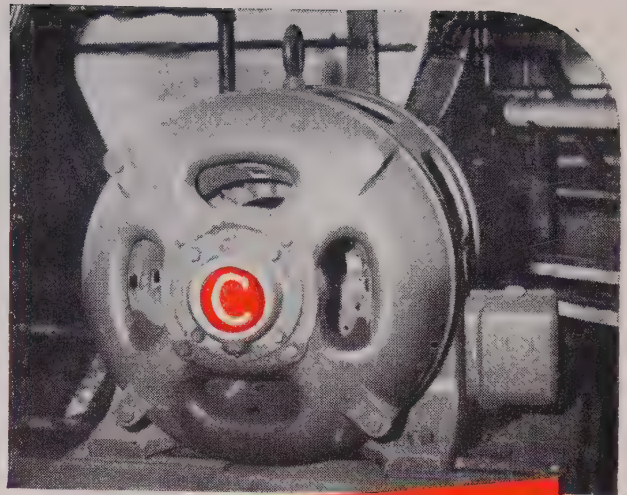
In the field of system engineering, the most notable advances have been the introduction of the load center distribution system for both high and low voltages, the trend toward higher

Century 40 horsepower, type SC motor driving an induced draft fan for a stack.

From

Century's

Line of Electric Motors You Can Select



- 1 Right Kind**—to match your current supply
- 2 Right Type**—to meet your load characteristics
- 3 Right Protection**—against atmospheric hazards
- 4 Right Size**—from 1/6 to 400 horsepower

Century Electric Company is celebrating its 50th year in the electrical industry.

The wide range of kinds, types and sizes of Century motors makes it possible to select a standard motor to meet the requirements of all popular applications.

They are available for both AC and DC current—high, normal and low torque characteristics. Types are also available for applications requiring varying speeds and reversing direction of rotation.

To protect against atmospheric hazards, Century motors are enclosed in open rated drip proof, splashproof, totally enclosed fan cooled and explosion proof frames. Many types are available with vertical and flange mountings as well as standard horizontal bases.

Specify Century motors for all your electric power requirements.

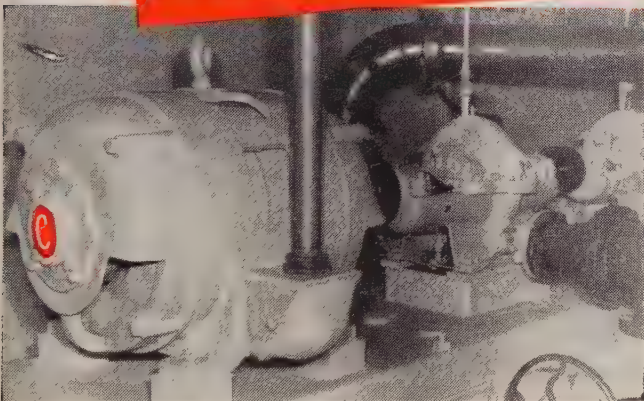
Popular sizes and standard ratings are generally available from factory and branch office stocks.



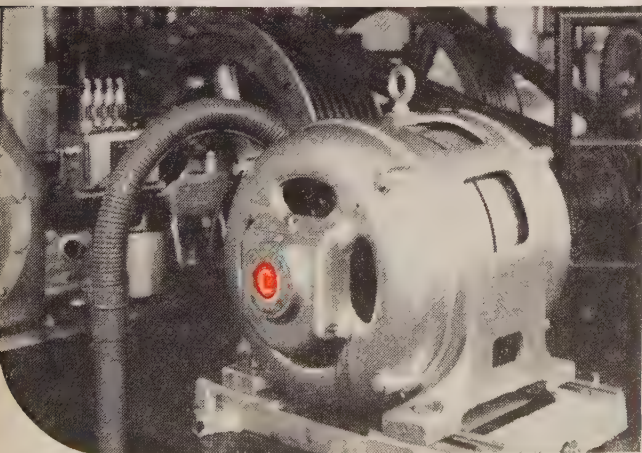
CENTURY ELECTRIC CO.

1806 Pine Street, Saint Louis 3, Missouri

Offices and Stock Points in Principal Cities



Century 150 horsepower, type SC motor driving a two-stage centrifugal pump in a city water plant.

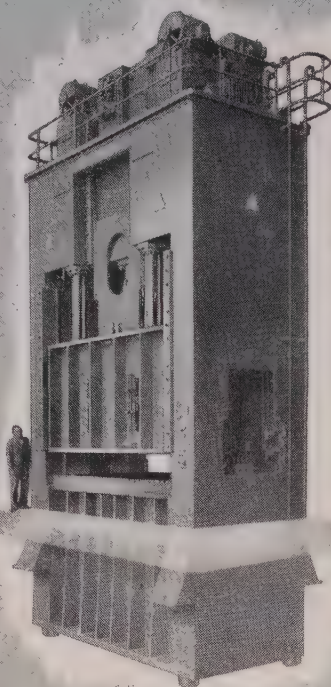


Two Century 75 horsepower SC high torque motors driving refrigeration compressors.

SELECTOR SWITCHES PROVIDE CHOICE OF THESE MAXIMUM CAPACITIES AND CORRESPONDING SPEEDS

SINGLE ACTION		DOUBLE ACTION	
MAXIMUM CAPACITY (Tons)	SPEED (Inches per minute)	(Figures refer to inner slide only. Blank- holder maximum capacity 500 tons in all cases.)	
		MAXIMUM CAPACITY (Tons)	SPEED (Inches per minute)
333	264		
667	132		
833	104		
1000	88	333	264
1167	75	667	132
1500	58	1000	88

Quick approach and return—400 inches per minute.



SPECIALIST in VARIETY

Most Clearing presses are built to do some special job with maximum production efficiency and thus at minimum cost per piece. But when the customer's requirement is for a press of wide utility, to take a great variety of work, Clearing still comes up with the right answer.

This hydraulic press can handle a draw of 30" with ample space for lift out. Yet when the work is shallow, it has a minimum shut-height of only 20". All of its 1500 tons capacity can be applied as a single action press, but movement of a few selector switches and removal of brackets makes it a double action machine with a 500 ton blankholder and 1000 ton punch. No slide bolster is necessary. Capacity can be reduced to as little as 333 tons with corresponding increase in pressing speed, and changed back again, with electric switches.

Quick, easy adjustment from one kind of work to another makes this specialist in variety a practical, economical answer to short run or jobbing problems. Ask us to show you how this press, or a different sized variation of it, can fit your requirements.

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS



THE WAY TO EFFICIENT MASS PRODUCTION

voltages, increased use of system neutral grounding, improved short-circuit protection, etc. The load center system approach is based on serving each load area by its own substation or substations. This provides economy at all voltages because the power is taken to the load center at higher voltage and there stepped down to utilization voltage. By having smaller substations for utilization areas, cost of the substation and switchgear for that area is reduced.

Many steel mills are now using 11.5 kv or 13.8 kv instead of 6.9 kv where power has to be transmitted at these voltages in substantial quantities and for relatively long distances. In even larger mills, higher voltages like 22 kv, 34.5 kv, or 69 kv, are used for the basic transmission of voltage from the source point to the load centers. Short-circuit protection, particularly in low-voltage systems, is receiving more and more consideration. Grounding the neutral of all system voltages has shown marked increase in service reliability and marked decreases in system maintenance costs.

Operation of a 12-inch Continuous Bar Mill, by A. H. Griffiths, superintendent of rolling mills, Sheffield Steel Corp., Kansas City, Mo.

In August 1948, the Kansas City Division of Sheffield Steel Corp. started operating a new type 12-inch continuous bar mill. Four common billet sizes are used in the mill—2, 2½, 3½ and 4 inches. These are heated in a continuous type furnace 32 x 50 feet with a rating of 60 tons per hour. Furnace can heat billets up to 30 feet long and can be fired by gas or oil.

The mill consists of 12 stands, plus three stands of vertical edging rolls, making a total of 15 stands. The roughing and intermediate stands are located in a straight line with No. 9 stand located 10½ feet to the left of the roughing and intermediate train, and stands 10, 11 and 12 situated 10½ feet to the left of No. 9 stand, thus allowing the use of two 180-degree repeaters.

Rolls used in stands 1, 2 and 3 of the roughing train are 18 inches in diameter by 36 inches in length, the 5-stand intermediate rolls are 14 inches in diameter by 32 inches in length, and the finishing rolls are 13 inches in diameter and 24 inches long. The rolls used in No. 1 and No. 2 edging stands are 13 inches in diameter by 7 inches in length, and No. 3 edging stand is 15 inches in diameter by 3½ inches long. Rolls are driven by individual variable speed motors with the exception of No. 1 and 2 stands and No. 4 and 5 stands.

These are coupled together by a motor for each set of stands.

No. 1 and No. 2 stands are driven by a 500-hp motor with an 800-hp motor driving No. 4 and No. 5 stands. The remaining stands are driven with their own individual 500-hp motors. No. 1 edger is driven by a 150-hp, No. 2 by a 100-hp, and No. 3 by a 100-hp motor.

Finished product from the mill can be either coiled or run onto the cooling bed depending on the orders.

The mill has been a good producer. During May 1951, it rolled 11,779 net tons consisting of 35 sizes of angles, in 267 operating hours.

Reconditioning Air Filter Oils, by George Findlay, lubrication engineer, Republic Steel Corp., Buffalo.

The steel industry, until recently, has attempted only to a very limited extent to filter air used in its operations. In effect, the only general approach to the use of filtered air throughout the industry was confined more or less to cooling large critical motors, motor generator sets and motor rooms.

Where periodic impeller replacement or repair intervals can be extended to any major extent, the attendant savings offered will quickly amortize the initial investment of the filtering equipment. The savings involved include reduction in abrasive wear of impeller blading, lessening of down time for repair and replacement of blading, etc.

Several different types of air filters are employed in the steel industry, with those of the travelling screen design predominating where blast furnace blowing equipment is involved. Primary purpose of the air filter in this case, is that of removing only the solids which will tend to abrade the blading.

Experience has indicated that to be effective, the air filtering equipment must be maintained on a continuous operating cycle. This in turn demands the installation of an automatic auxiliary oil reconditioning system to maintain oil in the screen reservoirs within acceptable limits of clarity. Changes to existing screen reservoir design would simplify the installation and increase the efficiency of the oil reconditioning unit.

This type of reconditioning system is found to maintain the flash point characteristics of a mineral oil, as used in the air filter reservoirs within the limits of safe operation. After investigation of the nonflammable fluids which are sometimes recommended for this service, it was deemed advisable to accept the possible fire hazard associated with the use of mineral oil in preference to

the toxicity hazards involved with the use of the former.

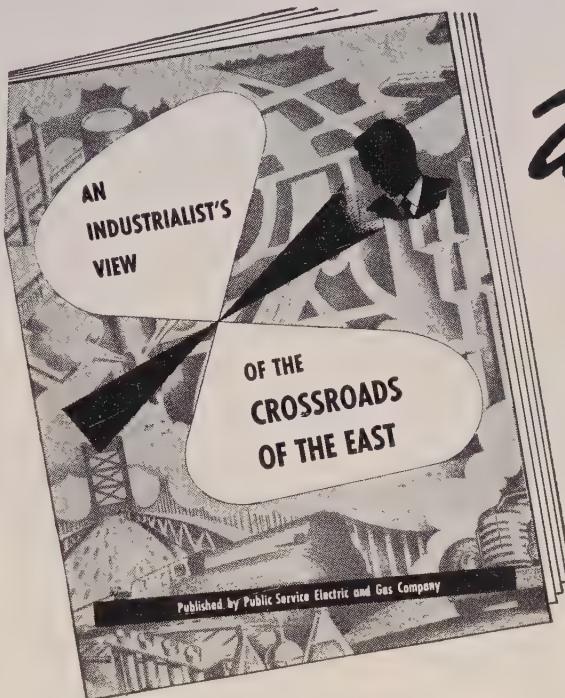
Roll Turning with Tracer Controlled Lathe, by Frank F. Zipf, superintendent, roll department, Bethlehem Steel Co., Johnstown, Pa.

The author describes briefly the development of tracer controls for various machine tools for a better understanding of their application to lathes. The article also gives a brief description of the different types of tracer controls, both electric and hydraulic, and the usefulness of this type machine in roll turning. Steps are also covered in the selection of the proper

grade of carbide tools which has made it possible to use this type of machine in the roll turning craft.

Heat Relief in Hot Industries, by B. R. Small, staff engineer, mechanical engineering department, Aluminum Co. of America, Pittsburgh.

Metal producing industries are obtaining increased returns from investments that provide employee relief from excessively hot working conditions. Industrial ventilation now utilizes radiant heat shielding at furnaces, local or spot air cooling and crane cab air conditioning. Increased building ventilation rates are made



*Written
for
You!*

JUST OFF THE PRESS

Are you interested in the industrial advantages offered to manufacturers in New Jersey, the Crossroads of the East?

Do you want to know the facts behind the success stories which have been accomplished by so many, diversified industries in New Jersey?

If you do, this booklet was written for you . . . and it's just off the press! It's called "The Industrialist's View of the Crossroads of the East", and within its 32 pages are complete reports written in digest style to give you the information you want about New Jersey quickly, clearly and completely.

Send today for your copy. Write Box A, Public Service, 76 Park Place, Newark, N. J., for the latest industrial facts about New Jersey, the Crossroads of the East.

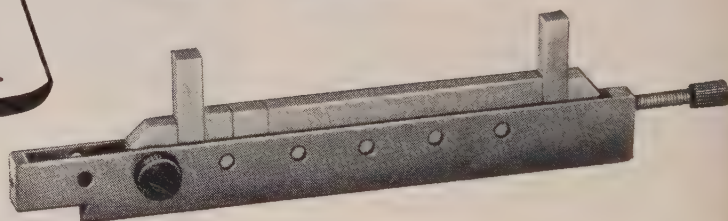


PUBLIC SERVICE
ELECTRIC AND GAS COMPANY
NEWARK, NEW JERSEY



With

A complete line of accessories.



A control number on every block.

PERHAPS you have never investigated the enormous possibilities in Gage Blocks for controlling dimensional accuracy and reducing spoilage! Look over the page at the right! You have some or all of these problems.

A set of 83 DoALL Gage Blocks with accessories will make over 120,000 different snap gages for about $\frac{1}{4}$ cent each. Any one of these gages are made quickly. Just fit the blocks together with the necessary holders and you are ready for any measuring job—checking finished work, jigs and fixtures or other working or inspectors' gages.

DoALL Gage Blocks are accurate to millionths of an inch. They are ready when you want them—there is no loss of time or waste of good tool steel as when making your own gages.

With a set of DoALL Gage Blocks and the DoALL Accessories you are fully equipped for absolute perfection in dimensional accuracy control. There is a full line of blocks in sets for every purpose in either Metric or English. You can't buy finer inspection equipment.

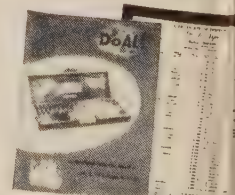
Ask for a demonstration of DoALL Gage Blocks in your plant. Your local DoALL Service Engineer will show them to you. Write or call!

A compact case.

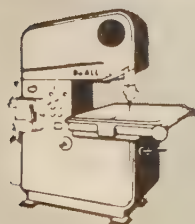
THE DoALL COMPANY

254 N. Laurel Avenue • Des Plaines, Illinois

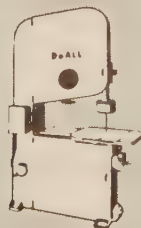
THIS BOOK will help you! MODERN MEASUREMENT CONTROL. Twenty pages describing DoALL Gage Blocks and accessories and how to use them. Ask, too, about DoALL Calibration Service for your present Gage Blocks. →



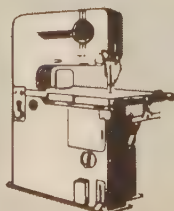
GB-4



CONTOUR-MATIC



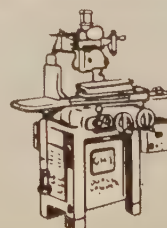
ZEPHYR



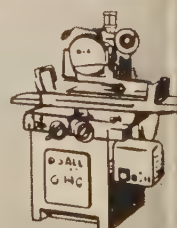
CONTOUR



BAND FILER



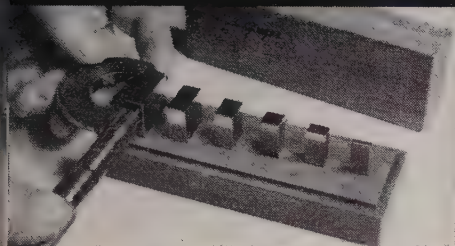
TOOLROOM GRINDER



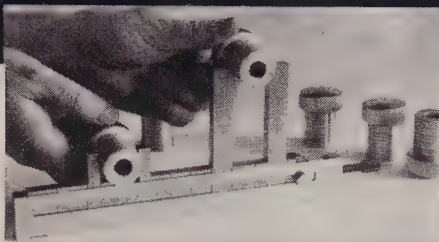
CRUSH GRINDER

DoALL *gage Blocks*

1. You get measurements in millionths of an inch!
2. You can "build" a gage in a matter of minutes!
3. You cut no metal — waste no material!



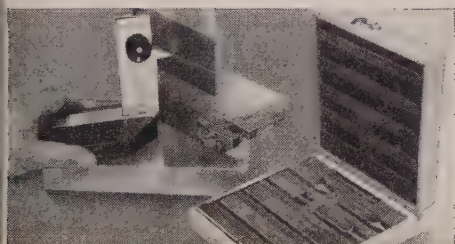
Checking your working gages — micro-meters, calipers, snap gages, etc.



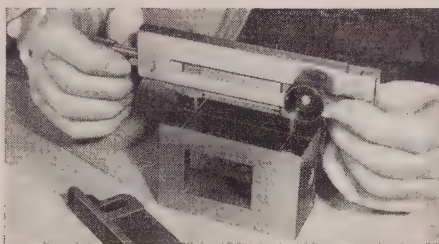
Go and no-go gages are quickly and inexpensively set up for checking parts.



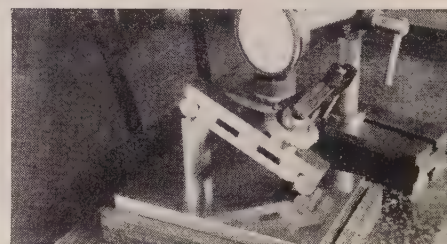
Height Gages for checking heights and bore diameters.



Scriber Point scribes straight lines with absolute accuracy.



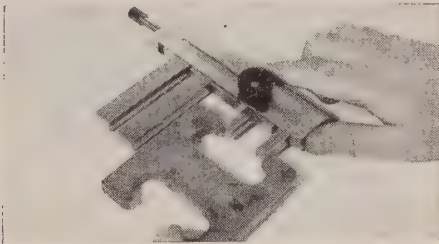
Checking layout dimensions using Gage Blocks, Trammel Points and Holder.



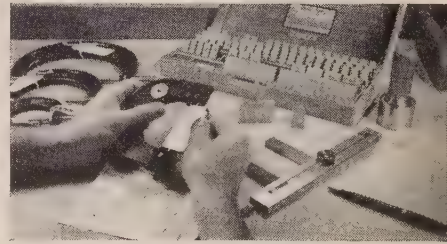
Gage Blocks, Comparator and Sine Bar being used to check bevel gear.



Checking machine settings and milling operations.

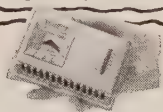


Checking fixed gages and snap gages with DoALL Gage Blocks.



Gage Blocks combined to check an adjustable snap gage.

Take time pieces for example . . .



Westclox
Elgin National Watch Co.
Hamilton Watch Co.
Gruen Watch Company

Benrus Watch Company
Bulova Watch Company
Minneapolis Honeywell
Regulator Co.

U. S. Time Corp.
Telechron
International Business
Machines Corp.

These are producers of highest quality products whose basic manufacturing accuracy is controlled by DoALL Gage Blocks.

The list of DoALL Gage users is the roster of production achievement.



Sales-Service Stores in All Principal Centers



**"SEE US AT
THE
METAL SHOW"**

Detroit,
October 15-19

**PEACE TIME
DEFENSE TIME
EVERY TIME**

"Standard's"

**Welded Mechanical Steel Tubing
MAKES THE TOUGHEST TUBING
FABRICATION POSSIBLE**



automobile's
propeller

automobile (banjo)
axle housing

spun tubular
coupling

**If you need the best tubing
for civilian or defense
purposes, "Standard's"
Mechanical Steel Tubing
can really "take it".**

**Automobile manufacturers too,
know "Standard" welded tubing
safely stands the severest tubular
applications. This is proven in the
automobile propeller shaft that
operates safely and dependably at
high R.P.M.'s day in and day out.**

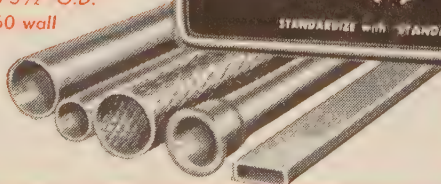
Specify

"Standard"
—IT PAYS!

**Peace time, defense time,
every time—"Standard's"
modern facilities, and
25 years of tubing know-how,
assure you the highest
quality tubing available.**



CARBON STEEL TUBING
1/2" O.D. to 5 1/2" O.D.
.028 to .260 wall



THE STANDARD TUBE CO.

Detroit 25,

Michigan

Welded Tubing

Fabricated Parts

STANDARDIZE WITH "STANDARD" — IT PAYS

STAINLESS STEEL TUBING
3/8" O.D. to 3" O.D.
.028 to .095 wall

possible by fan-powered roof ventilators, either conventional round wind-band design or the more convenient blackout or dome top styles.

Recently developed methods of radiant heat shielding by portable reflective sheet metal curtains have aroused considerable enthusiasm among operating crews and supervisors. About 90 per cent of the radiant heat from a hot furnace shell or brickwork surface can be intercepted by a curtain that comes to equilibrium only 20° F above room temperature. The convective component is dissipated as hot air through existing roof ventilators. In certain situations rather startling results have been obtained by this method.

For severe conditions unsuited to radiant heat shielding, an alternate method for sparsely populated areas consists of local or spot cooling, a method long used for shipboard engine and boiler rooms. Cooled air in this type of installation does not involve air conditioning, but merely washed air delivered from grilles at 80 or 85° F during hottest weather. This method may eliminate the need for increasing the ventilation rate, a step of formidable proportions in a large building.

In colder climates, serious situations often arise regarding inadequate heating and cold drafts. Studies indicate that these are by-products of the summer natural draft ventilation program with its open type buildings that are not easy to close in winter. Where better heating is required, consideration of winter as well as summer aspects frequently favor power ventilators and easily controlled air inlets, by means of which steam saving and uniform heating can be secured.

Layouts of new or modernized plants may benefit directly from ventilating considerations in early conferences. In one case, for example, a more compact building arrangement and a shorter production flow line was made possible by eliminating one line of space-wasting courtyards. Ventilation benefits were retained by use of a forced air supply, obtainable today without ductwork by use of the new fresh air type roof ventilators.

Considerable groundwork should be done with these applications before major projects are submitted to management, because radiation shielding and spot cooling procedure is still far from standardized. Further, various engineers as well as operating personnel have different yardsticks for measuring the end results in heat relief. Again, each plant and department frequently has special conditions that must be taken into account.

HAVE YOU TAKEN THE FOUR GOOD STEPS?

See page 6

This FREE New Booklet Tells You How

In its 28 illustrated pages you'll find the answers to many questions that affect the success of your electroplating on steel. You'll want to read more about:

- ❑ Which costs more: good electrocleaning or poor electrocleaning? *See page 4.*
- ❑ How can cleaning costs be reduced 33% while plating quality is being improved? *See pages 7 and 8.*
- ❑ What are four easy ways to improve the average rinse tank? *See page 10.*
- ❑ What rinsing fault is "an invitation to trouble" in the plating of high-carbon steel? *See page 11.*
- ❑ Why is it better to clean steel with reverse current than with direct current? *See pages 12 to 14.*
- ❑ What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*
- ❑ One part chromic acid in 1,000,000 parts of cleaning solution—does that spell D-A-N-G-E-R? *See page 16.*
- ❑ How can an ordinary electrocleaning cycle be transformed into an exceptionally good cycle? *See Cycle E on page 23.*

FREE For a copy of "Four good steps toward better electroplating on steel", write to Oakite Products, Inc., 34E Thames St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in
Principal Cities of United States and Canada

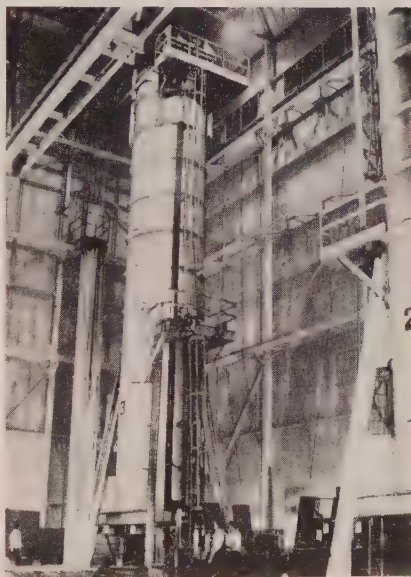
count. In spite of these road blocks, this new phase of industrial engineering can valuably contribute to plant economy and increased productivity.

A Comparison of Electric Furnace and Open Hearth Economics, by H. W. McQuaid, consulting metallurgical engineer, Cleveland.

This paper discusses in some detail the fundamental economic factors underlying the general steel industry and how they affect the choice of a melting unit. The question of location and size of markets, type of finished products and the general factors of supply and demand under present conditions and how they affect the choice of a melting unit are reviewed. At the same time, the difference in melting requirements under different degrees of integration and how these affect investment and operating costs are discussed and some of the limitations of the large tonnage fully integrated plants pointed out.

Present problems of freight absorption, delivery priority and steel short-

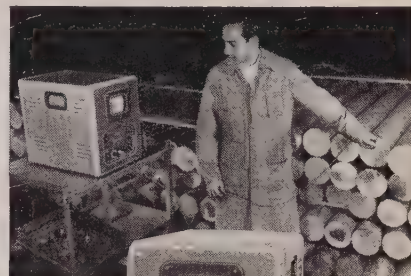
Heat Treating Done Vertically



HIGH STRENGTH extruded materials over 45 feet long and weighing up to 3000 pounds can be heat treated at Harvey Machine Co. Inc., Los Angeles. The unit shown above is the third installed at the company's aluminum extrusion plant, is electrically heated and has electronic controls. Material is mounted in a special holder, lowered into a water well seven stories deep and then hoisted inside the cylindrical heat treating units some six stories in height. Following heat treatment material is lowered into the water well for quenching

Sperry REFLECTOSCOPE MEANS "ON THE JOB" Ultrasonic INSPECTION OF METALS AT LOW COST IT'S Portable, TOO

Reflectoscope non-destructive testing locates internal defects accurately—instantaneously. Penetrates up to 25 feet. Tests raw stock, semi-finished and finished products and detects fatigue fractures. Available for rent, for lease and for sale. Write for descriptive bulletin 50-105.



95 lbs.
14 1/4" x
18 1/4" x
23 1/2"

TESTS
DEPTH
UP TO
25 FEET



THIS BOOKLET CAN
SAVE YOU MONEY
AND SPEED UP
PRODUCTION.
WRITE TODAY.

**SPERRY
Products, Inc.**
DANBURY, CONNECTICUT

Please send me the following:

☐ REFLECTOSCOPE BULLETIN 50-105

☐ NAME OF NEAREST REPRESENTATIVE

NAME

TITLE

COMPANY

CO. ADDRESS

CITY ZONE STATE

SPERRY ALSO MANUFACTURES
COUPLINGS, HYDRAULIC CONTROLS
AND OTHER TESTING EQUIPMENT

Under the



**TYPICAL HELP FOR PLANTS
SWITCHING TO
DEFENSE PRODUCTION**

Machining:

Shells
Mortars
Medium Calibre Guns
Small Arms
Armor-piercing Shot
Rocket Launchers
Jet Engine Parts
Bullet Cores
Cartridge Cases

Heat Treating:

Rocket Motor Bodies
Bazooka Motor Bodies
High Explosive Shells
Steel for Aircraft

Forging Monel Metal

**Cleaning and Preparing Metals to
meet Government Specs.**

**DEFENSE
PRODUCTION
DATA**

FROM

The
**HOUGHTON
LINE**

A factual record of heat
treating and metal-working
experience in processing
SHELLS * CANNON * SMALL
ARMS * AMMUNITION
* ROCKETS

Houghton man's hat there's help for you...

• Getting out into the shop as Houghton men are invited to do, they meet up with a whole lot of metalworking problems.

They're continually called on for help in solving problems like these: meeting high physicals in the heat treatment of "lean alloy" steels ... boosting machine output and reducing rejects ... developing lubrication that stands up under all operating temperatures ... cleaning metals faster at lower cost ... preventing idle equipment from rusting ... deep drawing safely at extreme pressures ... and so on.

By working on such a wide variety of problems Houghton has accumulated a lot of metalworking "know-how". We keep careful tabs on success stories through research data and field reports. And all of this information is constantly studied to find out how it can be more widely applied to help the whole metalworking industry.

Because of this vast metalworking experience Houghton men are called on repeatedly for aid—particularly by plants faced with unfamiliar conversion problems. Two-thirds of our sales and research organization today, are vet-

erans of World War II production experience.

Now another rearmament program is getting into full swing. Changes on the production line are popping up again. And Houghton men are busy helping customers lick *today's* problems.

Your Houghton man can help you with many of your problems right on the spot. He can also draw on the wealth of production data our research staff has at its fingertips. For example, the list at the left shows some typical help we can offer on defense production today.

Meantime, to make some of our extensive experience immediately available to you, we have put it into quick reference form. Called "Houghton Defense Production Data", this 60-page illustrated book provides you with information that may save endless hours of searching—and costly trial-and-error experimenting.

Get timely help with your conversion problems by sending today for your copy of this valuable book. Fill out and mail the coupon to E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pa.



Ready to give you
on-the-job service ...

E. F. Houghton & Co.
303 West Lehigh Avenue, Philadelphia 33, Pa.

Please send us a free copy of the new 60-page book,
"Houghton Defense Production Data"



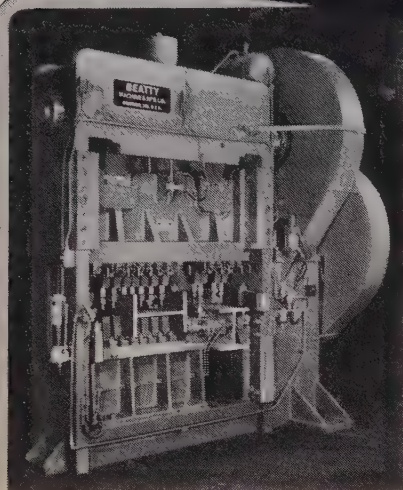
Name _____ Title _____

Company _____

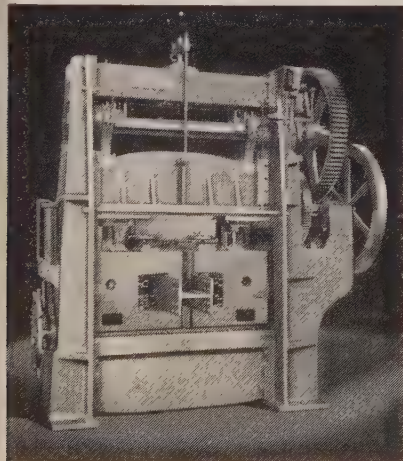
Address _____

City _____ Zone _____ State _____

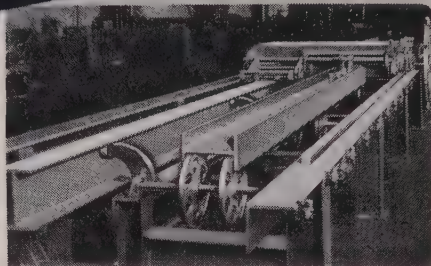
Five **ANSWERS** looking for a **PROBLEM**



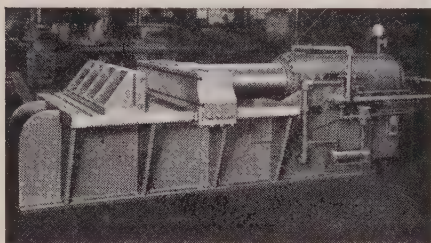
BEATTY No. 9 Guillotine Beam Punch for flange and web punching of beams up to 30".



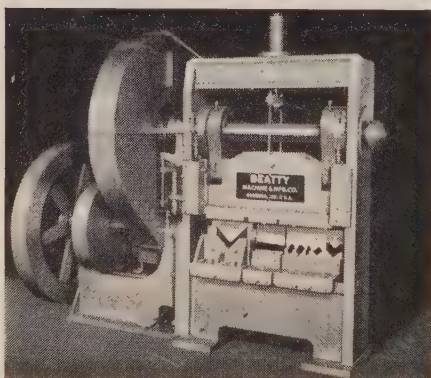
BEATTY Adjustable Flange Punch Tools punch all 4 flanges of I-Beams and wide flange beams at one pass through.



BEATTY Spacing Table handles flange and web punching of beams without roll adjustment.



BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.



BEATTY Guillotine Bar Shear for "short-order" shearing of flats, squares, rounds without changing tools.

BEATTY

Machine & Mfg. Co.

Hammond, Indiana

These five Beatty machines are speeding production, cutting costs in a lot of metal working plants. Perhaps one of these basic designs can be modified to meet your special needs. But if not there are more ideas where these came from. Let us know your problem and we will make a proposal. Our long and varied experience in machine design can be valuable to you.

ages of a large group of steel users are discussed and their effect on the demand for the installation of new steel producing equipment closer to the markets is noted. The subject of the economics of the small semi-integrated steel production unit in the more remote areas and what will be necessary to develop such plants is also discussed.

Examples are given of investment and production costs for different applications and the advantages of the electric furnace over the cold iron open hearth are noted. The large fully integrated hot metal open hearth plant is still able to produce more cheaply than the modern electric but only at a substantially greater investment all along the line.

One field for the electric melting furnace will be in its use in relatively small section ingots or the continuous casting process which permits rods, piercing billets and hot strip to be rolled directly from the cast ingot. The logical continuous-casting section is the wide slab of limited thickness.

Direct reduction of ore with the new low cost hydrogen now available promises in the near future to supply a charge material which will supplement scrap and tend to stabilize scrap prices and thus insure a charge for the electric furnace which will overcome the serious economic disadvantages of scrap as at present. This will make it more difficult for the open hearth even when operating on hot metal to produce ingots at a cost which is competitive with the modern high powered electric arc furnace. This development is discussed in some detail.

Future of the electric furnace lies in its contribution to the decentralizing of the steel industry. It provides the basis on which relatively small steel plants can be located in steel consuming markets at present relatively remote from the steel producing centers and supply these markets with standard or special steel products more economically than by any other means. It is pointed out that with the development of continuous casting and hydrogen reduced iron ore, there is a very strong possibility that the position of the open hearth may, in the not too distant future, be threatened in all but a few large steelmaking centers by the high powered modern arc furnace.

Chuck Data Published

Skinner Chuck Co. has published a 68-page booklet entitled, "Chucks and Their Uses." Photos and drawings show all types of standard and many special chucks. A full description is given on each type, giving details of

turn a production problem into a **LIGHT** subject—

make it of **BRASS**



These eighteen copper alloy parts, illustrated approximately half-size, go into the military flashlight produced by The Niagara Searchlight Corporation of Buffalo, N. Y. Only copper alloys can provide the complete range of physical properties needed and still maintain low manufacturing cost.

If, like this military flashlight, your product consists of parts calling for certain physical properties... if it must be born of a streamlined manufacturing budget and still be an aristocrat in quality—then you'll find no metal more versatile than brass.

Although almost all of these 18 metal parts differ in their function, copper alloys supply the required properties — high electrical conductivity, resilience, excellence as a plating base, strength, immunity to rust and resistance to corrosion. And to all these properties, singly or in combination, add the characteristic that

brass can be fabricated more economically by more methods than any other metal.

With all these properties, brass has no equal for its usefulness as a manufacturing metal. Brass is the metal on which your designers, cost analysts, production men and sales department will be most likely to agree.

Our Technical Department will gladly suggest the copper alloy best suited to your product and manufacturing methods. Just write to The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

51107

ANACONDA[®] *the name to remember in*

**COPPER
BRASS
BRONZE**

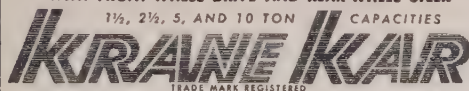
KRANE KAR
swings loads to
either side



KRANE KAR handles spare blooms for Blooming Mill, large slabs for Rolling Mill, charge boxes in Open Hearth, bars in Cold Drawn Bar Mill (finally loads them into railroad cars), changes rolls and bumper plates in Steel Strip Mill, and stands by to relieve heavy duty overhead cranes; transports all kinds of loads in Machine Shop, Construction and Maintenance Depts. With clamshell bucket, **KRANE KAR** moves sand in Welding and Foundry Depts., and coke in Coke Dept. Ask for illustrated Bulletin 89—"How Metalworking Plants Reduce Materials Handling Costs."

Gas or diesel, 12 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires. Buckets, magnets, and other accessories available.

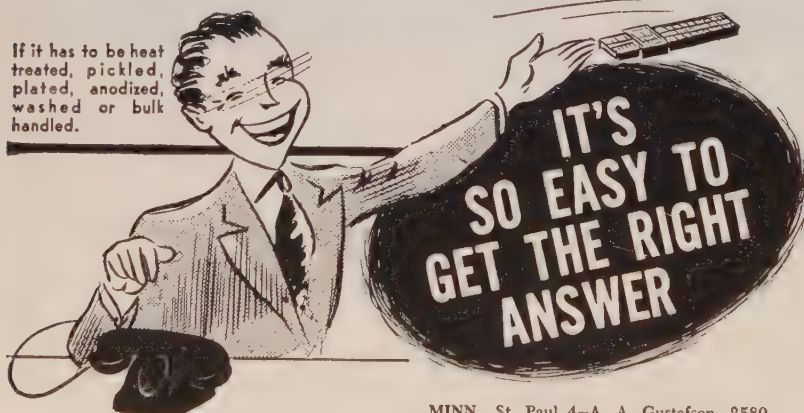
THE ORIGINAL SWING BOOM MOBILE CRANE
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER



USERS: Carnegie-Illinois, U.S. Steel, Bethlehem, Youngstown S & T, Basic Magnesium, Lima Locomotive, General Motors, Pullman Standard, etc.

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

If it has to be heat treated, pickled, plated, anodized, washed or bulk handled.



Avoid the costly mistake of using the wrong containers, baskets, trays or fixtures—call the Stanwood man in your locality. He'll see you promptly with the cost cutting facts—whatever your heat treating or parts handling job.

CALIF., Hollywood 28—Lloyd J. Bohan, 1680 N. Vine Street, Phone Granite 8367.

IND., Indianapolis 1—William McAtee, 626 N. DeQuincy Street, Phone Irvington 1483.

MASS., Brookline 46—Harry I. Dixon, Metallurgical Products Co., 1199 Beacon Street, Phone Longwood 6-8093.

MICH., Detroit 4—C. C. Miller, 8186 Livernois Avenue, Phone Tyler 5-3338.

CARBURIZING BOXES



BASKETS



FIXTURES



TRAYS



QUENCH TANKS



REVERTS



Stanwood Corporation



4825 W. Cortland St., Chicago 39, Illinois, Ph: Berkshire 7-5000

construction, use, mounting, etc.

There are additional chapters covering the care of chucks, lubrication and cleaning, safety measures, spindle noses, magnetic chucks, vises, etc. Copies may be secured by writing to the company at 344 Church St., New Britain, Conn.

Tension Tests Data on Rolled Strip Amplified

COMMENTING on the series of articles "Cold Rolling Strip—An Appraisal of Today's Theory and Practice" by J. D. Keller recently presented in **STEEL**, N. H. Polakowski, metallurgical department, University College of Swansea, Swansea, England, presents some problems of wide interest. He states:


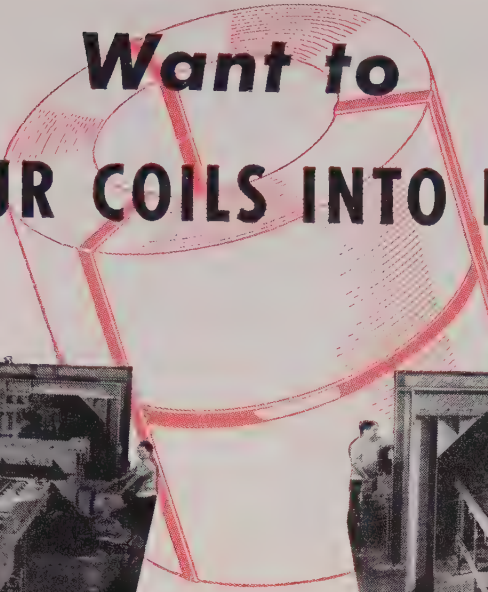
"The author in the May 14 issue of **STEEL**, page 98, considers the yield strength in tension to be equal to that in compression, and considers the higher values of compressive strength actually obtained to friction in the first place and to the lateral constraint in the second.

"I am not in agreement with these statements. It is true that ductile nonferrous metals do possess equal yield strengths in tension and compression, but this does not apply to steel. In carbon steels of all descriptions and also in numerous low-alloy steels the compression curve (in "actual," or "true" stress units) runs appreciably higher than the tensile curve, although the initial yield points are practically equal. I have made hundreds of experiments of this kind with always the same results, the difference between the two curves reaching over 10 per cent. Similar results were obtained by Siebel and Pomp 25 years ago and are reproduced in Nadai's book.

"If Huber's yield theory were applicable to the present case, one would expect the initial compressive yield strength of the annealed material to be about 15 per cent higher than in simple tension, provided the compression test is carried out on a fairly wide strip. Ford's comparative tests to which Mr. Keller refers show clearly that this is not the case, and the constrained compressive yield point occurs precisely at the same stress as does the yield point in tension. Why this is so, nobody seems to know, but this is the fact.

"Another important factor, which suggests that tension tests on rolled strip must underestimate the resistance offered by a metal to deformation by rolling, is known as the "Bauschinger Effect." This effect acts so that the resistance of a metal to deformation is reduced if a meth-

Want to CONVERT YOUR COILS INTO FLAT SHEETS?



Use
This New
Precision
Automatic
Shear Line
For Fast,
Dependable
Service
• • •

50" and narrower
 $\frac{3}{16}$ " and Lighter

COLD FINISHED BARS—Rounds, Flats, Squares, Hexagons.

STRIP—Cold Rolled, Hot Rolled, Pickled. Coils and Cut Lengths.

SPRING STEEL—Tempered, Annealed.

ALUMINUM—Sheets, Strip, Bars, Tubing.

SHEETS—Cold Rolled, Hot Rolled, Pickled, Galvanized. Coils and Cut Lengths.

TUBING—Seamless and Welded, Carbon and Alloy.

TIN MILL PRODUCTS—Black Plate.

STAINLESS—Sheets, Strip, Bars, Tubing.

DRILL ROD • FLAT WIRE • SHANK STEEL • SHIM STEEL • SILVER BRAZING ALLOYS AND FLUXES

*Complete Facilities for Cutting, Sawing, Shearing, Slitting, and Storage
Coil Leveling and Cutting to Length*

**FORT DUQUESNE
STEEL COMPANY**

PITTSBURGH 33, PENNSYLVANIA

**The HAMILTON
STEEL COMPANY**

CLEVELAND 8, OHIO

8 OK's

on every Arcos
Stainless Electrode



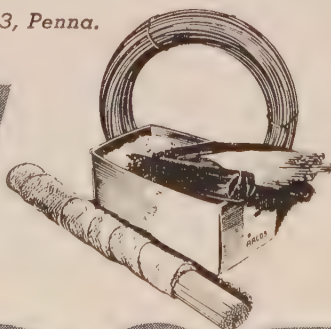
Rigid Quality Controls GUARANTEE Better Weld Metal

• There's no room for guesswork in manufacturing Stainless Electrodes that will produce consistently high quality welds on every application. That's why the raw materials that go into Arcos Stainless Electrodes must meet rigid specifications . . . why every electrode must pass so many quality tests before it's put to use. It means complete assurance that the weld metal will be physically, chemically and metallurgically right for the job you want to do.

ARCOS CORPORATION

1500 South 50th Street • Philadelphia 43, Penna.

WELD WITH ARCOS



Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

od of deformation is applied different from that used initially. If both methods of deformation differ little, the B-effect is small, but if they are different, it can be pronounced. It is easy to see that rolling is similar to compression, hence a small B-effect. On the contrary, tension is entirely different from rolling, hence the effect is strong, and consequently the yield strength is artificially depressed thus leading to unduly low yield strength figures. It may be added that a study of the Bauschinger effect and its implications offers a key to numerous unsolved problems of considerable practice interest, also in the rolling of metals.

"Mr. Keller suggests on page 100, of the same issue, that in my explanation of the speed effect in cold rolling, I have neglected the influence of the rate of strain upon the resistance to deformation. In actual fact I did not neglect it, but omitted it purposely (as can be understood from the Synopsis), since it was not essential for my thesis.

"One of the main objects of my paper was to explain why heavy ends are being produced on thin strip during acceleration and slow-down periods of cold mills. I attributed this phenomenon to the dependence of strip-to-roll friction of rolling speed, and have demonstrated that there is a close agreement between the behaviors of ductile metals when compressed, on one hand, and when rolled, on the other. As the ratio of threading to running speed in strip rolling is usually about 1:10, the effect of rate of deformation on roll force and strip gage can be only negligible, as is clear from Mr. Keller's Fig. 19. If these small changes are superimposed on Ford's diagrams, the difference will be hardly noticeable.

"I will be only happy to accept any better explanation than the one I gave, but so far I have not seen any. On the contrary, many recent authoritative results, both American and British, seem to support it.

"It may be of interest to note that similar findings to those made by Powell and Kaufman, as reported on page 86 of the March 26 issue, were made 15 years ago by Emicke and Lucas on a 14-inch laboratory mill."

REFERENCES

1. N. H. Polakowski: *Jl. Iron and Steel Inst.*, 1949, vol. 183, pp. 250-276.
2. N. H. Polakowski: *Jl. Inst. Metals (Brit.)*, 1949/50, vol. 76, pp. 755-757.

Replying to Mr. Polakowski's very interesting discussion, Mr. Keller comments as follows:

"The question whether the yield strength of steel strip material determined by tensile tests or the value determined by compressive tests, with certain corrections, should be used

in calculating roll pressures in cold rolling, must be regarded as still open. Mr. Polakowski's statement on this seems not in agreement with H. Ford's results (Reference No. 4) as given in Ford's Fig. 13 and discussion on his page 123, or with the later paper by Ford, Ellis and Bland (*Jl. Iron & Steel Inst.*, vol. 168, May 1951, page 4 and Fig. 9), where the compressive yield strength of steel after correction for lateral constraint averaged only about 3 per cent higher than the tensile yield strength—a difference possibly explainable by the extreme difficulty of entirely eliminating the end friction effect in compressive tests.

"By a coincidence, on the same day on which Mr. Polakowski wrote (July 23), Part VII was published in *STEEL*, wherein the Bauschinger effect was discussed at some length. However, in the first pass in cold rolling strip the Bauschinger effect would not occur, while in later passes it can play little if any part as regards the strip itself, since the yield strength of the latter has then increased practically to coincidence with the ultimate strength (Part VIII, p. 91.)

"In my reference to Mr. Polakowski's 1949 paper in Part V, I by no means wished to minimize, or to set aside with slight regard, his very ingenious theory concerning nonho-

Fork Truck Performs Extra Job



DUMPING a bin of scrap into a truck at Fafnir Bearing Co., New Britain, Conn., is this electric fork truck with a rollover attachment made by Automatic Transportation Co., Chicago. Slots cut in the base of bin accommodate the forks. The company is able to use its fork trucks for a variety of jobs in addition to handling materials in process by a little ingenuity in adapting them to these "bonus" tasks

PROVED

for saving critical alloys

Arcos Low Hydrogen Electrodes Replace Stainless For Welding High Tensile Steels

• Each day sees a growth in the requirements of nickel and chromium for defense production. The increased use of low hydrogen electrodes on welding high tensile steels is helping to free more of these critical alloys.

ARCOS low hydrogen electrodes are far removed from the experimental stage—they've already been "time tested and approved" on armor welding, as well as commercial applications. With them you get trouble-free, uniform welding performance because every one must pass the same rigid quality controls set up for Stainless.

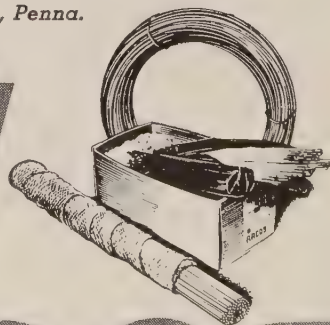
ARCOS CORPORATION

1500 South 50th Street • Philadelphia 43, Penna.

WELD WITH

ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes



mogeneous versus homogeneous deformation, but only to point out that much further study both theoretical and experimental will be necessary before his theory can be considered definitely proved or disproved."

Air Supplied for Varying Needs

A line of control system zoning Weathermakers, designed especially to provide independent control of air conditioning in separate areas of a building through a single unit, is announced by Carrier Corp., Syracuse, N. Y. Five sizes are being produced with air conditioning capacities ranging from 12 to 58 tons. The number of zones possible with the factory-built damper section varies from five for the smallest size to 14 for the largest. Intermediate sizes include seven and ten zone units.

Company officials said the units will be particularly useful in office or other multiroom buildings, manufacturing plants and other spaces where cooling or heating loads vary in different rooms or areas due to the changing position of the sun. In manufacturing plants, startup or shutdown of heat producing power equipment in various parts of the plant or the need for different processing temperatures makes zoning equipment especially applicable.

The new units are of the horizontal blowthrough type. Damper control for separate zones is provided through a double outlet arrangement, with one outlet supplying cooled and dehumidified air and the other supplying warm air. These twin outlets are divided into separate dampering compartments.

An independently operated double damper in each twin compartment regulates the proportion of warm and cool air for the zone, shutting down on the supply of one as the other is increased. Although normally mounted on the unit, the entire damper section can be set up in a remote location by installing warm and cool air ducts to the damper.

Aid for Welding Nickel

A booklet on the fusion welding of nickel and the high nickel alloys has just been published by International Nickel Co. Inc. It contains 44 pages and includes more than 30 tables and almost 50 drawings and photographic illustrations. It covers various forms of electric arc welding as well as gas welding. There are over 20 chapters and sections covering, in addition to detailed welding instructions, such information of importance to production and welding engineers as the boiler code of the American Society of Mechanical Engineers, pickling,

IT COSTS LESS

to have

your precision

metal parts

made by

TORRINGTON



Special equipment and volume production enable us to save for you on a wide variety of precision parts made to order.

Typical are mandrels or spindles for mounted grinding wheels, abrasive points, felt wheels. Shank diameters to .500", close tolerances, centerless ground if desired. Chuck ends rounded, no burrs. Sharp, clear uniform knurls. Concentric tapers. Mandrels accurately hand-straightened.

We are also set up to make for you such parts as special rollers, studs, dowel pins, screw driver and ice pick blades, surgical and dental instruments, pen and pencil barrels, instrument shafts and pivots, special needles, etc.

Send your prints and specifications today for a prompt quotation.

THE TORRINGTON COMPANY

Specialty Department

556 Field Street • Torrington, Conn.

Makers of

TORRINGTON NEEDLE BEARINGS

Greater Tonnage
Per Edge of Blade

A

**AMERICAN
SHEAR KNIFE CO.**
HOMESTEAD • PENNSYLVANIA

testing and inspection safety methods and associated topics.

Designated as technical bulletin T-2, the booklet is available without charge through the Technical Service Section, International Nickel Co., 67 Wall St., New York 5.

"Air Repair" Makes Its Bow

Air Repair, a new quarterly magazine devoted to the problems of air purification is to be the official publication of the 44-year old Air Pollution and Smoke Prevention Association of America. Its offices are now located in Mellon Institute, Pittsburgh.

Editor is Robert T. Griebing, a fellow of Mellon Institute and executive secretary of the association.

"There's a great deal of ground to cover," Mr. Griebing stated. "Study of air pollution abatement is most complex, requiring a knowledge of chemistry, physics, engineering, meteorology, and technology, and the subjects that present themselves for editorial treatment are endless.

"We want this new magazine to be a medium of exchange and information not only for our own members, but also for everyone interested in the problems of air pollution. We aim to keep our people posted on the latest activities and improvements in methods, techniques, and equipment. We want to assemble ordinances and be able to advise communities on practical and sensible legislation which will be of greatest good to the greatest number".

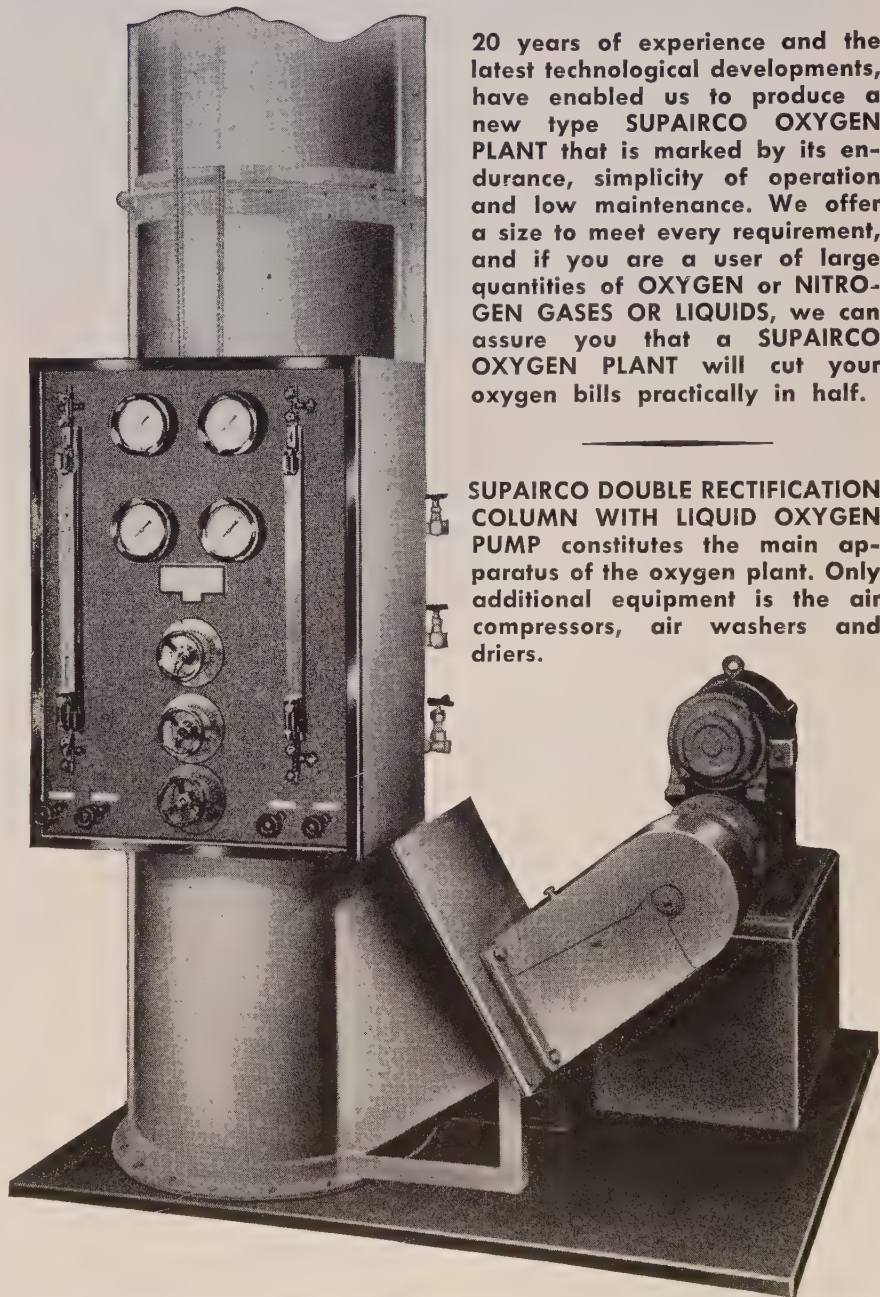
The association has more than 700 members at present. It is composed of municipal air pollution abatement officials, scientists, industrialists, and equipment manufacturers. To date, they have exchanged information principally through the publication of the proceedings of annual meetings, through correspondence, and through sectional meetings held several times a year in addition to the annual meeting.

Second issue of *Air Repair*, appearing this month, covers a discussion of gob piles, playground dust problems, incinerator construction, a meeting of the East Central Section, to be held in Detroit, some recent observations concerning the Los Angeles area problem, and other subjects.

Load Accurately Positioned

Crane controls so sensitive they can regulate the movement of a 250-ton load to within 1/32-inch were tested recently at McNary dam near Umatilla, Oreg., by the U. S. Army Corps of Engineers. Developed by Westinghouse Electric Corp., the ad-

SUPAIRCO Oxygen FROM AIR at Lowest Costs to You



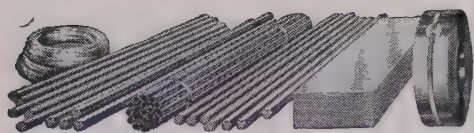
20 years of experience and the latest technological developments, have enabled us to produce a new type SUPAIRCO OXYGEN PLANT that is marked by its endurance, simplicity of operation and low maintenance. We offer a size to meet every requirement, and if you are a user of large quantities of OXYGEN or NITROGEN GASES OR LIQUIDS, we can assure you that a SUPAIRCO OXYGEN PLANT will cut your oxygen bills practically in half.

SUPAIRCO DOUBLE RECTIFICATION COLUMN WITH LIQUID OXYGEN PUMP constitutes the main apparatus of the oxygen plant. Only additional equipment is the air compressors, air washers and driers.

SUPERIOR AIR PRODUCTS CO.

128 MALVERN STREET • NEWARK 5, N. J., U. S. A.

Also Manufacturers of Plants and Apparatus for Liquid Air, Liquid Oxygen, Liquid Nitrogen and Containers and Flasks for Liquefied Gases.



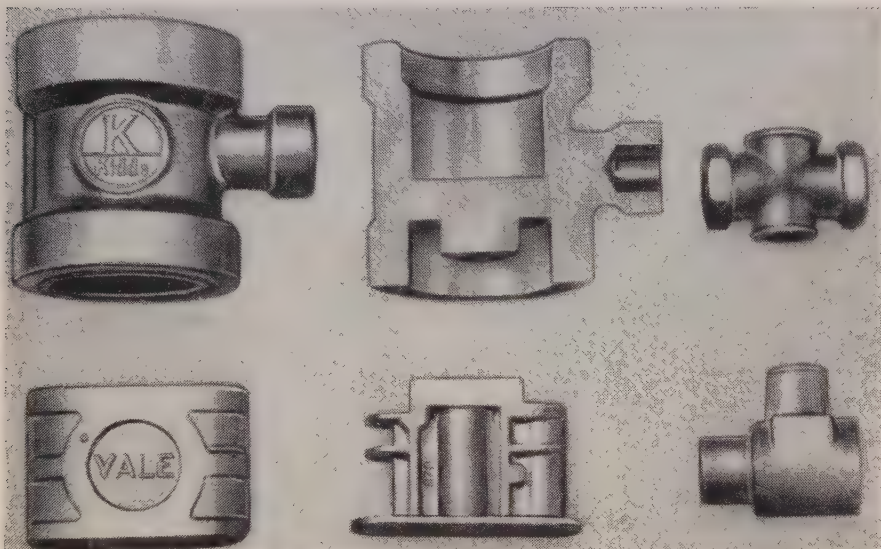
BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN



MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Cored Forgings Cut Machining Operations, Saves Critical Brass



Brass forgings with multiple coring: discharge head and cutaway to show coring; connector with four cores; lock case; lock body, three-core connector—courtesy National Cored Forgings Co., South Norwalk, Conn.

Long, deep cores on four sides in the same plane and a negligible flash substantially reduce the amount of metal needed to produce the illustrated brass forgings.

Through a process developed in Europe and brought to this country by National Cored Forgings Company, South Norwalk, Conn., dimensional accuracy of plus-minus 0.005 in. is maintained on all parts.

No Draft Necessary

High speed crank and screw presses are used in this process. Dies are of heat-resistant steels, as are the movable and fixed cores, and are of the split type. In this method no draft is used on either the dies or the punches eliminating many machining operations on the forging itself.

This forging operation is an extru-



Spud with hole straight through. Billet at right indicates small amount of metal needed for spud.

sion and hot-pressing procedure and dense, porous-free forgings are produced.

Billets are carefully weighed so that the metal weight, with the exception of a very thin flash, is the weight of the

complete forging.

A good example of weight saving is seen in the discharge head in the upper left of the picture. The forging which was normally used weighed 4½ pounds. The illustrated forging weighs only 2½ pounds. The saving came through the coring which can be seen in the cut-away section next to the part.

Clean Finishes Obtained

Through careful applications of a parting medium, finishes on the forgings are clean as a diecast part.

At the bottom is seen a lock case which accurately takes the lock body next to it. Not only has weight been reduced but many machining operations have been eliminated through very close dimensions in the intricate contour.

The spud in the small illustration is shown with the billet used. To obtain the large, through hole, it was cored from two directions and then the thin web was pierced out as a secondary operation. This is only necessary on certain types of forgings.

Step cores and through cores are also possible.

All types of copper-base alloys suitable for forging can be worked within this coring process.

(7327)

BRIDGEPORT FORGING ROD

	Bpt. Forging Rod 133	Naval Brass 24	Manganese Bronze 19	Muntz Metal 14	Duronze III 707	Silicon Bronze 632
ANALYSIS						
Copper %	59.50	60.0	58.5	59.75	91.0	97.03
Lead %	1.75	.15				2.85 Silicon
Tin %	.20	.75	0.75			0.12 Iron
Zinc %	38.55	39.1	39.45	40.25		
Iron %			1.0		7. Aluminum	
Manganese %			0.3		2. Silicon	
MECHANICAL PROPERTIES AS HOT FORGED						
Ten. Strength psi		60,000			90,000	60,000
Yld. Strength psi		25,000			45,000	24,000
Elongation % in 2"		35			30	70
Rockwell Hardness		B52			B85	B35
PHYSICAL CONSTANTS						
Melting Pt. (Liq) °F	1,640	1,650	1,630	1,660	1,810	1,895
Density, lbs/cu. in.	.305	.304	.302	.303	.278	.309
Coeff. Therm. Exp. per °F from 77°F to 572°F-6 x 10 ⁻⁶	11.5	11.7	11.8	11.6	9.2	9.3
Thermal Conduc. Btu/sq. ft/ft-hr/°F @ 68°F	69	67	63	71	20	20
Elec. Cond. % IACS @ 68°F Soft	27	26	25	28	7	7

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

DEZINCIFICATION CORROSION (Cont'd)

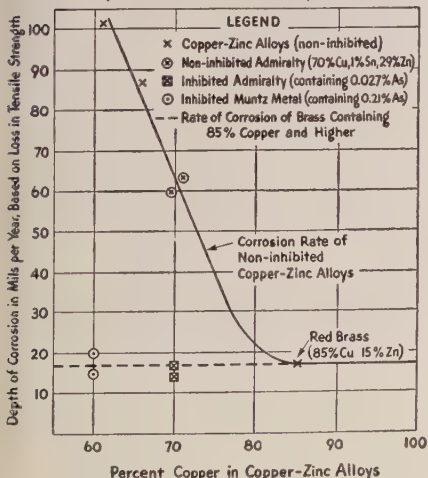
Dezincification Can be Inhibited

Last month in this column it was shown that dezincification of the copper-zinc alloys in 1% Cupric Chloride solution is unlikely to occur when the copper content of the alloy is over 85%. Other corrosion tests, conducted in 1% Cupric Chloride solutions, revealed that a small percentage of arsenic or other inhibitors alloyed with brasses containing less than 85% copper increased their resistance towards dezincification.

The corrosion rate of the arsenical brasses tested dropped to approximately the same level as that of the uninhibited brasses containing 85% or more copper. The results of these corrosion tests are shown in the following figures where the dashed line is the corrosion rate for the copper-zinc alloys containing 85% or more copper. These data show that the addition of 1% of tin to brass (Admiralty metal -70% Cu, 29% Zn, 1% Sn), under the conditions of testing, has very little effect on the extent of dezincification. However, Admiralty metal containing 0.027% arsenic and Muntz metal (60% Copper, 40% Zinc) containing 0.21% arsenic were practically equal to red brass (85% Copper, 15% Zinc).

In connection with the subject of inhibitors, it is interesting to note that the alloying of arsenic to brasses containing more than 85% copper has very little effect on the corrosion rate in 1% Cupric Chloride solutions. While arsenic will inhibit dezincification in the brasses it will not inhibit other types of corrosion.

CORROSION RATE OF INHIBITED and NON-INHIBITED COPPER-ZINC ALLOYS in 1% Cupric Chloride Solution for 78 Days at Room Temp.



Boring-Burnishing Tool For Close-Tolerance Hole

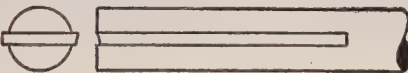


Bearing insert with outside knurl to insure anchoring in casting and mirror-like bore with 0.003" tolerance (twice size).

Boring of brass bearings and sleeves in screw machines can be accomplished to close tolerances and excellent finish with a carbide boring-burnishing tool.

Using this type tool and free machining brass rod, one manufacturer maintained a tolerance of 0.0003" and produced a burnished surface on the I.D. of a $\frac{1}{8}$ " long bearing which was used as a casting insert.

The tool was made as follows: First, a slot was milled in a shank which was about $\frac{1}{16}$ " smaller than the bore. In the centerline was inserted a piece of carbide wider than the bore desired; in this case $\frac{1}{8}$ " thick and $1\frac{1}{4}$ " long.



Boring-burnishing tool used to produce bearing diameter in screw machine. Courtesy The Waterbury Screw Machine Products Company, Waterbury, Connecticut.

The carbide was then radially ground to the diameter of the finished bore. Next, one lip was ground with front and side clearances. The opposite side, with the original radius, served as the burnishing tool. The cutting edge was broken with a diamond stone to insure a smooth cut.

For finishing, 0.004 to 0.006" was left in the hole. Fine feed and high speed were used.

In this work, the tool insert should be longer than the hole being bored. For larger holes, wider difference between shank and insert provides chip clearance.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Sheet Metal Joiner seams sheets of any thickness from 16 to 30 gage at speeds up to 8 feet every 40 seconds. Work is placed on long grooved anvil. Roller assembly—powered by 2 hp motor—travels along screw over work once in each direction. Pressure, derived from force exerted by roller assembly against over-head steel beam, is said to reach 11,000 psi.

No. 1179

Optical Straightedge utilizes beam of light as straightline reference and is said to detect deviations as small as $\pm .00005$ " in flat surfaces. Unit consists of lens and prism housing and a feeler microscope which rides along surface. Relative positions of two indices, observed through microscope, indicate surface deviations. The instrument is available in four sizes with approximate lengths of 3, 5, 10 and 13 feet.

No. 1180

Automatic Press Feeder handles stock up to 2" wide and 0.045" thick. Mounted directly on die set, the unit has a maximum feed of 2" on presses with $1\frac{1}{2}$ " or greater stroke, and $1\frac{3}{8}$ " on 1" stroke presses. The completely adjustable feed is controlled by press movement.

No. 1181

Geared Motor contains two secondary pinions which drive the output gear. This reportedly doubles its effective torque rating when compared with conventional single pinion drives. Made in sizes from 5 to 25 hp, with speeds from 30 to 84 rpm, the motor incorporates a splined herringbone pinion to divide the load equally between the two secondary pinions.

No. 1182

Rotary Indexing Table is said to be especially proportioned for bench mill, shaper or drill press. The unit is equipped with three index plates, each having six circles of holes. Table is $\frac{6}{16}$ " in diameter, $2\frac{3}{8}$ " high.

No. 1183

Remote Voltage Control is a foot-pedal-operated variable resistor for most d-c arc welders and some a-c types. Voltage can be varied instantly during welding, giving the operator proper welding heat for various steps in fit-up and position. Arc can be extinguished at completion of the weld to avoid cratering.

No. 1184

Pantographic Roll Engraver mills, routs and engraves completely around cylinders and rolls from 6 to 12 inches in diameter and up to 40 inches long. Maximum area covered by cutter at one setting is reportedly 5 x 20 inches. Power is provided by $\frac{1}{2}$ hp variable speed motor, which drives heavy-duty spindle at speeds from 500 to 12,000 rpm.

No. 1185

Sound Level Meter is extremely light and compact—easily held in one hand. Built with sub-miniature tubes and components, the unit operates on hearing-aid batteries. The sound-level range is said to be from 34 to 140 db above the ASA reference level of 0.0002 dynes per square centimeter.

No. 1186

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

Warehouse Service with Slitting Facilities in Principal Cities

Advertisement

justable-voltage control is installed on the first of two massive 200-ton gantry cranes built by the Judson Pacific-Murphy Corp., Emeryville, Calif. These cranes will be used to raise and lower the 126-ton spillway gates at the dam. When a gate is raised, the load on the crane approaches twice the weight of the gate, because of the downward pressure of the water rushing under it.

Each crane is 60 feet long, 42 feet wide, and towers 77 feet above the top of the dam. Mounted on 16 wheels, the giant cranes move along the top of the dam on rails.

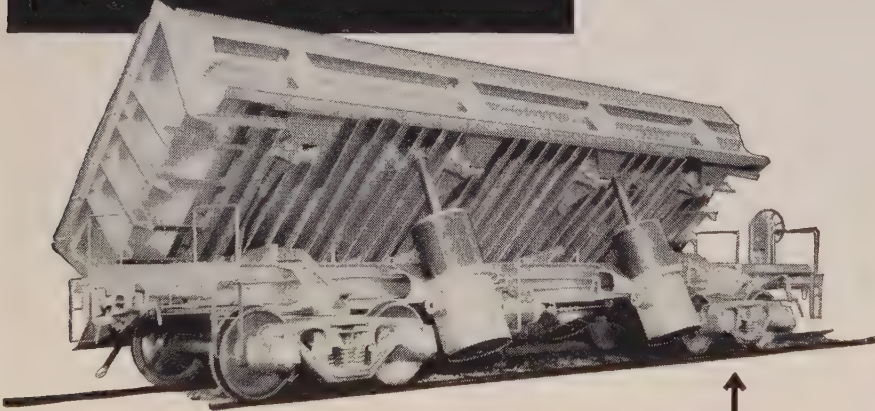
Adjustable-voltage control embodies speed-torque characteristics that inherently cause the motor to slow down in both the hoisting and lowering cycle when the load is increased without change in the setting of the control. The control monitors the load on the motor, and adjusts the speed accordingly, using a Rototrol rotating regulator. The system provides a stalling torque of 200 per cent of full-load torque, thus limiting maximum mechanical and electrical stresses.

Direct current motors for the main hoist, trolley and bridge drives are

powered through a four-unit motor-generator set mounted in the machinery house on the main trolley atop each crane. The set converts 440v ac power to dc. For simplicity of design and operation, the dc voltage is controlled by the generator fields, rather than by resistors in series with the motors. Solenoid brakes assist in spotting the load and in holding the trolley and hoist drives.

Despite the heavy loads handled by the cranes, the main hoist motor is only 60 hp. This power, transmitted through an extensive gear train, permits a maximum speed of 4 feet per minute when the main hoist is under full load handling the spillway gates.

BOOSTS EARNINGS TOO!



The Differential Air Dump Car has a way with operating expenses — cuts 'em down!

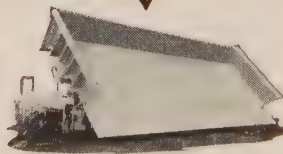
There's another pair of massive muscles on the other side of the car, too, means two-way dumping and greater flexibility.

They're built to take rough treatment — whether it's the slam-banging of the clam or the sudden dumping of tons of hot slag. These cars can take it and can come back faster for more.

Higher ratio of payload to dead weight! Fewer trips to the shop and shorter stays when they do go! Add all these up and it spells lower operating costs — another way to say "Boosted Earnings". Write for the full story on these cars.

Other Differential Products: Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Dumping Devices and Complete Haulage Systems.

DUMPS BOTH WAYS



Tuning Cores Pressed Quickly

Automatic Mfg. Corp., Newark, N. J., manufacturers of radio and television components, uses three DDS-2 rotary powder metal presses built by F. J. Stokes Machine Co., Philadelphia, to make all tuning cores for their intermediate frequency transformers. Automatic installed its first powder metal press in 1945. From an initial production of 1000 tuning cores per hour, the company now produces over 10,000 per hour of these powder metal parts.

To make these tuning cores, the

Waterfall Cools Turbine Wheel

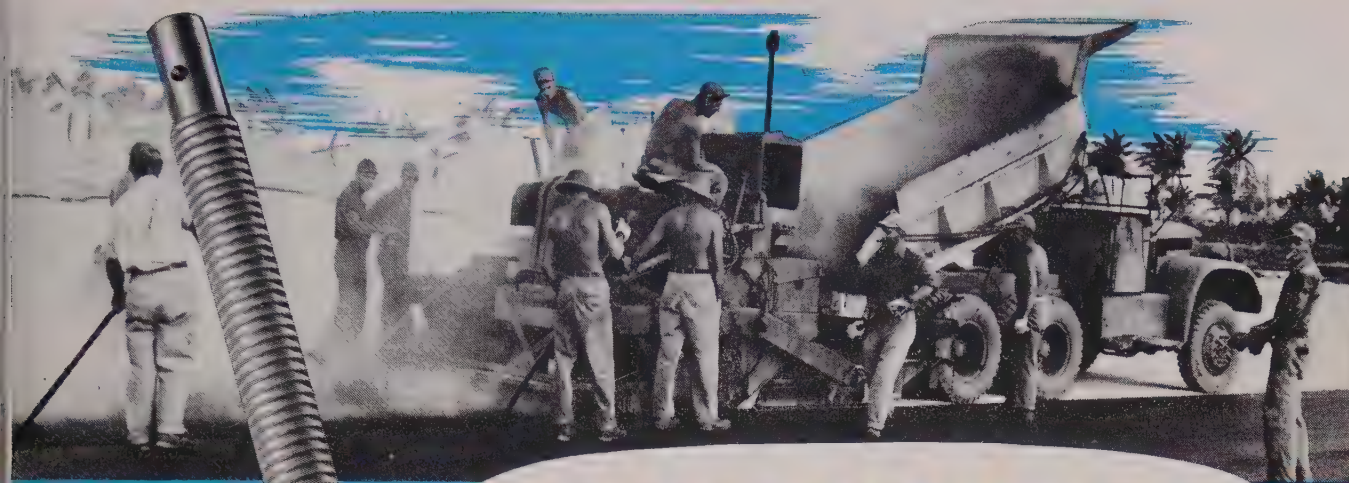


CASCADING down the 30-foot length of a turbine shaft at General Electric Co.'s turbine divisions in Schenectady, N. Y., is an industrial waterfall that plays a big part in shrink fitting the wheel to the shaft. Wheel is heated in an oven so that bore will expand and then placed on the main shaft and lowered into position. Cooling by air and water shrinks it tight. An inspector then checks the fitting of the keys and position of wheel on shaft

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT



This thickness control screw, made from STRESSPROOF steel bar, is a vital part of the asphalt road layer shown laying an air strip at a Pacific base.

COSTS DOWN 25%
PRODUCTION UP 100%

**WHEN STRESSPROOF REPLACED
HEAT-TREATED .40 CARBON
ALLOY STEEL BARS**

• ***Speeded
Machining
50% to 100%***

• ***Eliminated
need for
Heat Treated
Alloy Bars***

In this asphalt road layer, instead of using a heat-treated, hot-rolled .40 carbon alloy bar, STRESSPROOF was specified. STRESSPROOF provided *in-the-bar* the necessary strength and wear resistance, and machined so much easier that production time was cut in half.

STRESSPROOF's unique combination of four important qualities *in-the-bar* is cutting costs and speeding production on many similar defense jobs. STRESSPROOF is twice as strong as ordinary cold-finished bars. Its resistance to wear often makes carburizing unnecessary. It is stress-relieved to minimize distortion, and has *in-the-bar* machinability fully 50% better than heat-treated alloys of the same hardness. Yet STRESSPROOF is less expensive than all cold-finished and most hot-rolled alloy steel bars that have been fully heat treated.

STRESSPROOF is also available with a Ground and Polished finish.

LASALLE STEEL CO.

1414 150th Street, Hammond, Indiana
Manufacturers of the Most Complete Line of Cold-Finished
and Ground and Polished Bars in America

LaSalle
STRESSPROOF®

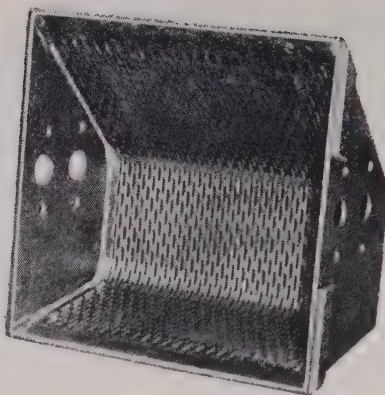
SEVERELY COLD-WORKED, FURNACE-TREATED CARBON STEEL BARS

STRESSPROOF
**IS PLAYING A VITAL ROLE
IN NATIONAL DEFENSE!**

A very large proportion of STRESSPROOF production, today, is going into defense jobs. However, from time to time sample bars may be available for testing purposes.



Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.



Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

1876—SEVENTY-FIFTH ANNIVERSARY—1951

HENDRICK

Manufacturing Company

30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

company combines finely divided iron powder with a phenolic resin, which acts as a binder and insulator. The iron powder and resin are mixed together in a suitable mixer and the putty-like mass is granulated first in a hammermill and then in a granulator. This classified powder is then pressed. The resin is cured, and threads are ground on the outer periphery of the core.

The press assures accuracy of weight by overfilling each die cavity and scraping off excess material, as well as by the design of the weight adjusting mechanism. Application of pressure simultaneously from both top and bottom gives uniform density throughout the piece.

Sets Two Nuts at Once

Two new double Clinchor units have been furnished to Ternstedt Division, General Motors Corp., Detroit, by Tomkins-Johnson Co., Jackson, Mich. The machines are tooled to feed and set two $\frac{3}{8} \times \frac{1}{2} \times 3/16$ -inch thick Fabri-Steel nuts at each operation. The anvil position of the left hand Clinchor is adjustable in a front-to-back direction, and also with respect to height. The anvil position of the right hand Clinchor is adjustable in a left-to-right direction.

Welding Alloys Chart Issued

A new chart of Eutectic Low Temperature welding alloys, measuring 10 x 14 inches, suitable for wall hanging or for purchasing department files, has been issued by Eutectic Welding Alloys Corp., Flushing, N. Y. The chart contains detailed specifications on close to 200 metal-joining alloys including bonding temperatures, tensile strengths, etc.

Major listings show proper welding alloys for use with cast iron, steel, stainless steels, copper, brass, bronze, nickel and nickel alloys, aluminum and aluminum alloys, magnesium alloys and zinc die castings as well as for hard overlaying, cutting, chamfering, piercing, gouging and joint preparation of all metals.

Power Brushing Saves a Step

By combining two production processes into one automatic brushing operation a manufacturer of razor blades is effecting sizable dollar savings and getting better finishes. Heat treat scale is removed and the strip prepared for name etching by power brushes made by Osborn Mfg. Co., Cleveland. The change came about after the razor blade manufacturers found the former method was too expensive and called in Osborn brushing specialists.

The two jobs formerly were done



Over one thousand in daily service.

Control Dust

...with this

RUEMELIN TUBULAR TYPE FILTER

A Ruemelin Tubular Type Cloth Filter is the modern way to handle industrial dusts created in foundry cleaning rooms, metal working plants, cement mills and many other applications. The simplicity of Ruemelin Dust Filter design means low operating and maintenance costs. Definite power savings are assured by lower resistance to air flow.

NEW DUST FILTER BULLETIN AVAILABLE

Write for our new Bulletin No. 24-D just released. Learn for yourself the advantages you secure with a Ruemelin Bag Filter and at no extra cost.

RUEMELIN MFG. CO.

MANUFACTURERS AND ENGINEERS
SAND BLAST AND DUST COLLECTING EQUIPMENT
3882 NORTH PALMER STREET • MILWAUKEE 12, WISCONSIN, U. S. A.

A 5881-1/4R

by machines having six brushing heads. Power brushing and improvements in hardening techniques enable the manufacturer to use a two station automatic machine that does both operations simultaneously. Razor blade strip is pulled through brushes rotating at 3450 rpm at 50 feet per minute. Bevel gears move the brushes up or down as required. Brush life is extended by reversing them as they become grooved from wear.

Materials Handling Facts Given

Efficient handling of raw and finished materials, their proper storage and how modern materials handling machines can expedite manufacture to cut costs, save time and money, is the theme of a booklet, "Basic Facts About Materials Handling," published by Clark Equipment Co. How to combine small units into big ones for more efficient handling, how to route materials, how to utilize overhead space for storage, how to use trailer trains and how to best make use of a limited manpower force are a few of the subjects discussed.

The publication also discusses the latest equipment in the materials handling field, and how to figure costs of its use. Cost analysis information includes how to figure amortization of machine investment, fixed charges and the variable charges that change from job to job. It is a simple way to determine the economic advantages of modern handling equipment in almost any given situation.

Making the best use of existing machines through utilization of attachments, and multiple usage, is covered also, as are the possibilities of powered hand trucks. Copies of the booklet will be sent in response to requests directed to the Clark Equipment Co., Industrial Truck Division, Battle Creek 62, Mich.

Steam Costs Computed

A slide rule type calculator designed to provide a ready means of computing steam costs has been made available by the Cleaver-Brooks Co., Milwaukee, manufacturer of steam boilers and other equipment for the generation and utilization of heat. The pocket size calculator, is available without cost to engineers, plant executives and those who will find it useful in their work. It enables the user to compute the comparative steam costs per 1000 pounds using coal, oil or gas—and based on fuel costs of price per ton, price per gallon and price per cubic foot.

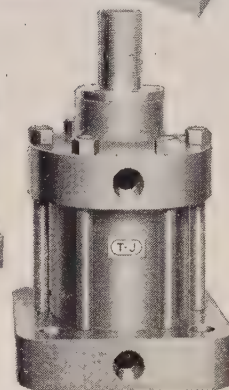
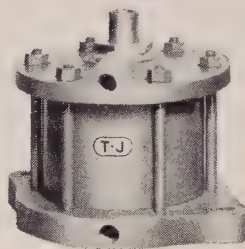
The steam cost calculator takes into account the efficiency of the system. Users of the steam cost calcu-



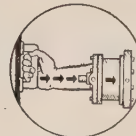
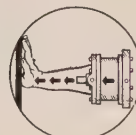
T-J Hydraulic Cylinders furnish efficient, automatic "push power" for feeding devices in this new Ajax-Northrup induction forge heating equipment.

This unit—manufactured by Ajax Electrothermic Corp., Trenton, N. J.—automatically heats steel forging stock in sizes ranging from 1 to 4 inches (rounds or squares) at 2250°F. at rate of 7500 to 8500 lbs. per hour. Has space for 8 heating stations... each with *hydraulically operated billet feeding devices employing T-J Cylinders*. These cylinders also eject heated bars automatically. Induction heating with this equipment results in uniformity of successive billets fed to the forge—thus controlling quality of finished forgings and reducing rejects.

Do you have a tough job in power movement—pushing, pulling or lifting? Let T-J help you *simplify machines, save labor and cut costs* by using T-J Air or Hydraulic Cylinders! Many standard sizes and styles... cushioned or non-cushioned... 100 lb. or 50,000 lb. Precision-built, long life. Write for more information. The Tomkins-Johnson Co., Jackson, Mich.



FOR POWER MOVEMENT
IN ANY DIRECTION



100 LBS. or
50,000 LBS.

35 YEARS EXPERIENCE

TOMKINS-JOHNSON

RIVETORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHERS



ELECTROMET

Data Sheet

Published by Electro Metallurgical Company, A Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

ALLOYS FOR THE STEEL, IRON, AND NON-FERROUS INDUSTRIES

PRODUCT*	NOMINAL COMPOSITION	USES	PRODUCT*	NOMINAL COMPOSITION	USES
BORON ALLOYS			CHROMIUM ALLOYS cont.		
Ferroboron Min. 10.00% Boron Grade	Silicon.....max. 1.50% Aluminum.....max. 0.50% Carbon.....max. 1.50%	Increases hardenability of steel; also, for additions to malleable iron and aluminum alloys.	Foundry Ferrochrome High-Carbon Grade	Chromium.....62 to 66% Silicon.....7 to 10% Carbon.....5 to 7%	Developed especially for high-solubility ladle additions of chromium to improve composition and properties of cast iron.
Min. 17.50% Boron Grade	Silicon.....max. 1.50% Aluminum.....max. 0.50% Carbon.....max. 0.50%		Low-Carbon Grade	Chromium.....50 to 54% Silicon.....28 to 32% Carbon.....max. 1.25%	
Manganese-Boron	Boron.....min. 17.50% Manganese...approx. 75% Silicon.....max. 1.50% Carbon.....max. 3% Iron.....max. 5%	Used to cleanse and deoxidize non-ferrous alloys.	Chromium Metal Low-Carbon Grades	Chromium.....min. 97% Carbon.....max. 0.10% and 0.50% Iron.....max. 1%	Production of wide variety of non-ferrous chromium-bearing alloys including electrical resistance alloys and high temperature alloys.
Nickel-Boron	Boron.....15 to 18% Silicon.....max. 1.50% Aluminum.....max. 1.00% Carbon.....max. 0.50% Iron.....max. 3.00% Nickel.....Balance	Special boron alloy used principally for deoxidizing nickel and its alloys.	High-Carbon Grade	Chromium.....87 to 90% Carbon.....9 to 11% Iron.....max. 1.25%	
Boron Carbide	Boron.....45 to 50% Carbon.....45 to 50%	Deoxidizer for non-ferrous alloys.	"EM" Ferrochrome-Silicon No. 1 Grade	Chromium.....39 to 41% Silicon.....42 to 46% Carbon.....max. 0.05%	In production of stainless steels, these alloys are used to reduce metal oxides from the slag back into bath.
Calcium Boride	Boron.....38 to 42% Calcium.....27 to 32% Carbon.....15 to 20%	Welding rod coating.	No. 2 Grade	Chromium.....36 to 39% Silicon.....36 to 39% Carbon.....max. 0.05% Aluminum.....7 to 9%	
SILCAZ Alloy	Boron.....0.55 to 0.75% Silicon.....35 to 40% Calcium.....9 to 11% Aluminum.....6 to 8% Titanium.....9 to 11% Zirconium.....3 to 5%	A complex boron addition agent for increasing the hardenability of steel.	"EM" Ferrosilicon-Chrome	Chromium.....50 to 54% Silicon.....28 to 32% Carbon.....max. 1.25%	For adding chromium and silicon to steels containing up to 1 or 2 per cent chromium.
CALCIUM ALLOYS			COLUMBIUM ALLOYS		
Calcium-Silicon	Calcium.....30 to 33% Silicon.....60 to 65% Iron.....1.50 to 3%	Deoxidizer for quality ingot steel. Also used in high-tensile gray irons.	Ferrocolumbium	Columbium.....50 to 60% Silicon.....max. 8% Carbon.....max. 0.40%	Stabilizer in austenitic chromium-nickel stainless steels. Also constituent of high-temperature alloys.
Calcium-Manganese-Silicon	Calcium.....16 to 20% Manganese.....14 to 18% Silicon.....53 to 59%	A complex deoxidizer used widely in production of steel castings.	Ferrotantalum-Columbium	Columbium...approx. 40% Tantalum....approx. 20% Cb+Ta.....min. 60% Silicon.....4 to 6% Carbon.....max. 0.30%	Another stabilizer, used to supplement ferrocolumbium, in austenitic chromium-nickel stainless steels. Also used in high-temperature alloys.
Calcium Metal Regular Grade	Calcium.....98% (Cylinders, Slabs, Cut Pieces, or Turnings)	Reducing agent in metallurgical applications, deoxidizer and degasifier for non-ferrous metals, particularly magnesium.	MANGANESE ALLOYS		
Distilled Grade	Calcium...approx. 99.90% (Irregular pieces from pea size to 14 in. lumps)	For special applications requiring calcium of very high purity.	Standard Ferromanganese Regular Grade	Manganese.....78 to 82% Carbon.....approx. 7% Silicon.....max. 1%	Most common means of adding manganese to steel for both alloying and deoxidizing purposes. Also for counteracting sulphur in steel and cast iron.
CHROMIUM ALLOYS			Low-Phosphorus Grade	Manganese.....78 to 82% Carbon.....max. 7% Silicon.....max. 2% Phosphorus...max. 0.10%	
Low-Carbon Ferrochrome	Chromium.....67 to 71% Silicon.....0.30 to 1.00% Carbon (10 Grades) max. 0.03 to max. 2.00%	Production of stainless steels and high-temperature alloys requiring low carbon content.	Low-Carbon Ferromanganese Low-Phosphorus Grade	Manganese.....min. 90% Carbon.....max. 0.07% Phosphorus...max. 0.06%	Additions of manganese to steels of low-carbon specification, particularly stainless steels of 18 per cent chromium, 8 per cent nickel type.
High-Carbon Ferrochrome Max. 4.50, 5.00, or 6.00% Carbon Grade	Chromium.....67 to 70% Silicon.....1 to 2%	For production of engineering alloy steels and other alloy steels of moderate chromium content.	Regular Grades	Manganese.....85 to 90% Carbon....max. 0.07, 0.11 to 0.15, 0.30, or 0.50%	
Max. 7.00% Carbon Grade	Chromium.....66 to 69% Silicon.....1 to 3%		Regular Grade (High-Silicon)	Manganese.....80 to 85% Carbon.....max. 0.75% Silicon.....5 to 7%	For making low- and medium-carbon manganese steel and Hadfield steel.
Min. 7.00% Carbon Grade	Chromium.....65 to 68% Silicon.....1 to 3%	For additions of nitrogen to improve properties of high-chromium steels.	Medium-Carbon Ferromanganese	Manganese.....80 to 85% Carbon.....max. 1.25 to 1.50%	
Nitrogen-Bearing Low-Carbon Ferrochrome	Chromium.....67 to 71% Silicon.....0.30 to 1.00% Carbon.....max. 0.10% Nitrogen...approx. 0.75%		Silicomanganese Max. 1.50% Carbon Grade	Manganese.....65 to 68% Silicon.....18 to 20%	A versatile alloy used as furnace block, deoxidizer, and also for making manganese addition to steel in the ladle and in the furnace.
"SM" Ferrochrome	Chromium.....60 to 65% Silicon.....4 to 6% Carbon.....4 to 6% Manganese.....4 to 6%	A high-solubility chromium addition for steel or iron in either furnace or ladle.	Max. 2.00% Carbon Grade	Manganese.....65 to 68% Silicon.....15 to 17.50%	
			Max. 3.00% Carbon Grade	Manganese.....65 to 68% Silicon.....12 to 14.50%	

*All of the alloys and metals listed are produced in the usual lump, crushed, or ground sizes, except where other special forms are indicated.

PRODUCT*	NOMINAL COMPOSITION	USES
MANGANESE ALLOYS cont.		
Iron-Manganese	Manganese.....85 to 90% Carbon.....approx. 7.00% Silicon.....max. 3% Iron.....max. 2%	For high manganese additions to certain non-ferrous alloys, particularly aluminum.
Manganese Metal	Manganese.....min. 96% Carbon.....max. 0.20% Silicon.....max. 1.00% Iron.....max. 2.50%	Used both as deoxidizer and alloy in production of numerous non-ferrous metals and alloys.
1" Silico-Manganese Briquets (Cylindrical Shape)	Manganese.....2 lb. Silicon.....½ lb. Total Weight.....3½ lb.	For adding manganese (with silicon) to cast iron in the cupola.
1" Ferro-Manganese Briquets (Long Shape)	Manganese.....2 lb. Total Weight.....3 lb.	For adding manganese (without silicon) to cast iron in the cupola.

SILICON ALLOYS		
75% Ferrosilicon		
Regular Grade	Silicon.....47 to 51%	Deoxidizer for most grades of killed or semi-killed steel. Blocking grade specially sized for maximum efficiency.
Blocking Grade	Silicon.....47 to 51%	
75%-Aluminum Grade	Silicon.....47 to 51% Aluminum.....max. 0.40%	
65% Ferrosilicon		
75%-Aluminum Grade	Silicon....61.50 to 66.50% Aluminum.....max. 0.50%	Mainly for production of electrical sheet steel.
75% Ferrosilicon		
Regular Grade	Silicon.....73 to 78%	Deoxidizer and alloy for production of high-silicon spring and electrical sheet steel. Graphitizing inoculant for cast iron.
75%-Aluminum Grade	Silicon.....73 to 78% Aluminum.....max. 0.50%	
85% Ferrosilicon		
Regular Grade	Silicon.....83 to 88%	Enables melter to add higher percentages of silicon without chilling metal in ladle. Graphitizing inoculant for cast iron.
85%-Aluminum Grade	Silicon.....83 to 88% Aluminum.....max. 0.50%	
92% Ferrosilicon		
Regular Grade	Silicon.....92 to 95%	Permits large additions of silicon without harmful chilling effect.
92%-Aluminum Grade	Silicon.....92 to 95% Aluminum.....max. 0.50%	
Silicon Metal		
Regular Grade	Silicon.....min. 97 or 96% Iron.....max. 1 or 2%	Additions of silicon to non-ferrous metals, particularly aluminum and copper, to improve physical properties.
Purified Grade	Silicon....99.70 to 99.90% Iron.....005 to .015%	For applications in non-ferrous industry requiring silicon of high purity.
Low-Calcium Grade	Silicon.....min. 97% Iron.....max. 1% Calcium.....max. 0.10%	For the production of high-silicon aluminum alloys where calcium is detrimental.
Low-Aluminum Grade	Silicon.....min. 98% Iron.....max. 1% Aluminum.....max. 0.10%	For the production of silicon-copper alloys where aluminum is detrimental.
SMZ" Alloy	Silicon.....60 to 65% Manganese.....5 to 7% Zirconium.....5 to 7%	Particularly strong graphitizing inoculant used in making ladle additions to cast iron.
Special Graphitizer	Ferrosilicon Compound	Acts as both deoxidizer and graphitizer in cast iron. Useful in controlling chilling tendencies.
Magnesium-Ferrosilicon	Silicon.....approx. 46% Magnesium...approx. 8.5%	For ladle addition to cast iron to obtain special properties.
Barium-Silicon	Barium.....40 to 50% Silicon.....45 to 55%	For deoxidation of non-ferrous alloys.
1" SM" Silicon Briquets (Cylindrical Shape)		
Large Size	Silicon.....2 lb. Total Weight.....5 lb.	For adding silicon to cast iron in the cupola.
Small Size	Silicon.....1 lb. Total Weight.....2½ lb.	

ELECTROMET, "EM," "Silcaz," "SM," and "SMZ," are trade-marks of Electro Metallurgical Company and Carbon Corporation.

PRODUCT*	NOMINAL COMPOSITION	USES
TITANIUM ALLOYS		
Ferrotitanium	Titanium.....27 to 32% Carbon.....max. 0.10%	For adding titanium to stabilized austenitic chromium-nickel stainless steels and to high-temperature metals.
Silicon-Titanium	Titanium.....40 to 50% Silicon.....45 to 50% Iron.....max. 3%	For additions of titanium to steels or non-ferrous alloys.
Manganese-Nickel-Titanium	Titanium.....43 to 48% Nickel.....approx. 25% Manganese.....max. 8% Aluminum.....max. 18% Iron.....max. 5% Silicon.....approx. 2% Carbon.....max. 0.15%	Deoxidization of nickel alloys.

TUNGSTEN ALLOYS		
Ferrotungsten	Conforming to A.S.T.M. Spec. A 144-39	For production of tool and die steels; also high-temperature alloys.
Tungsten Metal Powder		
Melting Grade	Tungsten....min. 98.80% Total Carbon..max. 0.25%	Production of tungsten steels and cast tungsten carbide.

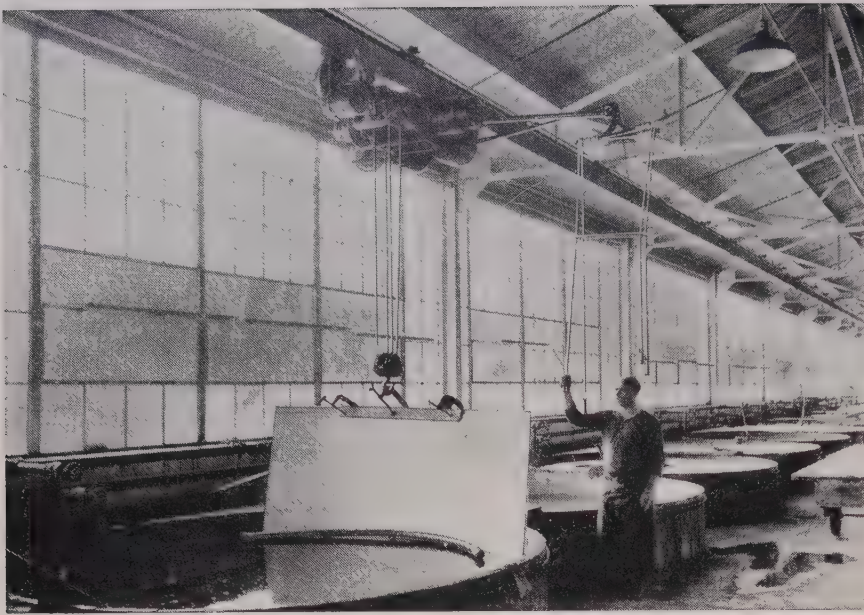
VANADIUM ALLOYS		
Ferrovanadium	Vanadium.....50 to 55% Carbon....max. 0.20, 0.50, or 3.00% Silicon....max. 1.50, 2.00, or 8%	Production of tool and engineering steels, high-strength structural steels, non-aging rimming steels, and wear-resistant irons.
Vanadium Oxide Fused	V ₂ O ₅.....86 to 89% Na ₂ O.....approx. 10% CaO.....approx. 2%	For addition of vanadium to steel and for manufacturing catalysts.
Sodium Polyvanadate (Red Cake)	V ₂ O ₅.....approx. 85% Na ₂ O.....approx. 9% CaO.....approx. 2% H ₂ O.....approx. 2.5%	For manufacture of vanadium compounds, including vanadium catalysts.
High-Purity Ammonium Metavanadate	V ₂ O ₅.....approx. 99.50% NH ₄ VO ₃.....min. 99%	

ZIRCONIUM ALLOYS		
12 to 15% Zirconium Alloy	Zirconium.....12 to 15% Silicon.....39 to 43% Carbon.....max. 0.20%	This zirconium alloy is a powerful deoxidizer. It also increases depth of hardening.
35 to 40% Zirconium Alloy	Zirconium.....35 to 40% Silicon.....47 to 52% Carbon.....max. 0.50%	Deoxidizer for fine grades of alloy steels. Used for adding larger amounts of zirconium.
Nickel-Zirconium	Zirconium.....25 to 30% Nickel.....40 to 50% Aluminum....approx. 15% Silicon.....max. 10% Iron.....max. 5%	Effective for deoxidizing and degasifying nickel and its alloys.

IF YOU HAVE A METALS PROBLEM

More than 50 different alloys and metals are produced by ELECTROMET in hundreds of varying compositions and sizes. If you need help in selecting the proper alloys, or have some specific metallurgical problem, be sure to consult one of ELECTROMET's specially trained metallurgists and engineers. Address your inquiries to one of the offices listed below.

Birmingham 3, Ala.....Brown-Marx Building
Chicago 1, Ill.....230 N. Michigan Avenue
Cleveland 14, Ohio.....Union Commerce Building
Detroit 2, Mich.....6-240 General Motors Building
Los Angeles 58, Calif.....2724 Leonis Boulevard
New York 17, N. Y.....30 East 42nd Street
Pittsburgh 22, Pa.....2207 Oliver Building
San Francisco 6, Calif.....22 Battery Street
In Canada: Electro Metallurgical Company of Canada Limited, Welland, Ontario



How to keep a hoist from growing old before its time!

The time to add years to the life of your hoist is *before you buy it!*

You can do this and avoid costly production slow-downs later if, before you buy, you estimate what the maximum and average loads are to be; how frequently your hoist will be called upon to handle those loads within a given period.

You will also want the answers to these questions: What distance is the load to be lifted and lowered, and at what speeds? How quickly must the hoist travel from one location to another to keep production at top efficiency? What temperatures are likely to prevail? Are there any corrosive influences? . . . and many others.

You can save your time now, and considerable trouble later, by asking a Shepard Niles specialist to study your problem and recommend the most economical hoist for you—in terms of your own specific operations. We invite your inquiries.

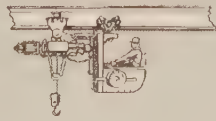
Shepard Niles

CRANE & HOIST CORPORATION

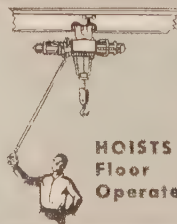
Makes and sells all three lifting tools for airborne shop loads



CRANES • Overhead



HOISTS • Cab Operated



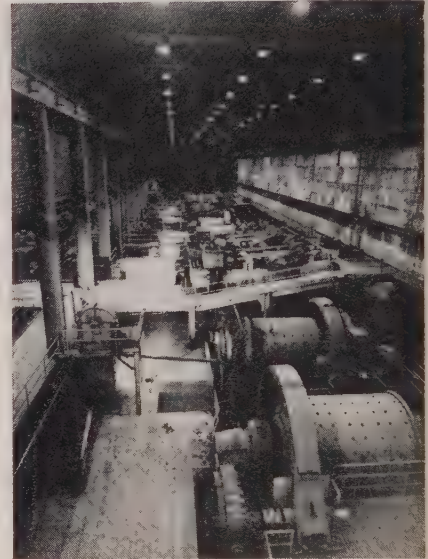
HOISTS • Floor Operated

358 SCHUYLER AVENUE • MONTAUR FALLS, N. Y.

lator can easily determine the costs of operating a Cleaver-Brooks steam boiler as compared with other types of oil, gas or coal-fired equipment.

Nickel Capacity Expanded

Simultaneous completion of two projects by International Nickel Co. of Canada Ltd.—a new shaft and a new concentrator at its Creighton mine. Total expenditures of \$17 million are involved in the projects, says R. Leslie Beattie, vice-president and general manager of Canadian opera-



CONCENTRATOR GRINDING AISLE . . . handles 10,000 tons of ore per day

tions. The shaft brings to 13 the number of operating shafts in underground mines in the Sudbury district. The mill, which concentrates ore before transportation to the smelter at Copper Cliff, Ont., has a capacity of 10,000 tons of ore a day.

Additional underground ores will serve as replacement of open pit ores and will enable the company to continue refined nickel production capacity at the present rate of about 250 million pounds per year. When designed in 1948, the mill was to have a daily capacity of 6000 tons, but plans were changed two weeks after the outbreak of hostilities in Korea to accommodate the additional tonnage.

Now in full operation, the two projects are described by Mr. Beattie as being "part of our extensive program of underground mine development launched during World War II in anticipation of the depletion of our open pit surface mine which contributed substantially to nickel production during the war and since. Including these completed projects, the program has already involved capital expenditures of more than \$100 mil-

lion. When the program is completed in 1953, the company's underground mines will be able to deliver 13 million tons of ore annually, compared with 5.7 million tons of underground ore hoisted in 1950".

Models Solve Problems—Problem of mining ores from the lower grade sections at Creighton was complicated by the fact that higher grade ores had previously been removed from the areas below the lower grade ores, according to Mr. Beattie. Old mine openings interfered with an orderly arrangement of opening for the new program. This and many other problems were solved by using models built to scale and embodying the factors anticipated in actual underground mining.

Extensive laboratory, pilot plant and operational scale test work preceded designing in 1948 of the Creighton concentrator. With the near doubling of capacity long after construction had started, plans and construction procedures had to be revised without interfering with building in progress and yet put the plant in operation ahead of schedule.

Using an Old Timer—The new shaft, called Creighton No. 7, is sunk in one of the oldest operating mines of International Nickel. Geological studies of the Creighton orebody in 1856 foreshadowed its later discovery in 1885; and the first shipment of ore from Creighton to the smelter in Copper Cliff was made 50 years ago in August, 1901.

Designed for ore-hoisting only, the No. 7 shaft is sunk to an initial depth of 2,050 feet. It is 8½ feet by 24 feet in cross section and is concrete-lined throughout.

Serving No. 7 shaft is a 14-foot by 110-inch parallel double-run geared hoist. The skips have a capacity of 15 tons each, and the hoisting capacity is 700 tons per hour.

The new 10,000-ton concentrator at Creighton is a compact plant with many unusual features of design and operation. It is built at the site of No. 7 shaft; the headframe and hoist house are integral parts of the mill building, and ore from the mine is hoisted directly into the crushing plant. Part of the mill feed is non-magnetic ore brought by conveyor from another Creighton shaft two-thirds of a mile distant. The crushing plant has a simple straight-line flow sheet with no circulating loads.

Plant's water supply is obtained through a 6-mile pipeline from the Vermilion river, and the product, a bulk concentrate, is pumped through another line 7½ miles to Inco's reduction plants at Copper Cliff. Sand removed from the flotation tailing is returned to be used as backfill



two big names
in
industry

**NEWCOMB-DETROIT
COMPANY**
as manufacturer

**KALAMAZOO STOVE
AND FURNACE CO.**
as the user

find **PLATECOILS** more
profitable to use

It is less costly to buy and install Platecoils than it is to fabricate pipe coils in their own plant according to Robert Dill, Plant Superintendent of the Newcomb-Detroit Company, Grand Rapids Division. In building the hot rinse tank pictured above they have realized many advantages resulting from the use of Platecoils both for themselves and their customer, Kalamazoo Stove and Furnace Co.

Starting with the original estimate, sales engineers find it much easier to determine the coil size from the convenient Platecoil chart. And Platecoils can be depended upon to deliver the amount of heat specified in their B.T.U. rating. In the construction of the tank, Platecoils are easier to handle and fabrication time and labor are reduced. A Platecoil with the equivalent B.T.U. capacity as pipecoil takes only half the space in the tank thus leaving greater working area. This is important also to Kalamazoo Stove and Furnace Co. as the user.



The extra tank capacity comes in handy in the use of the tank as part of an acid etching system used for pickling aluminum prior to spot welding on aircraft parts. And the higher B.T.U. capacity of the Platecoils provides faster heating and quicker starts.

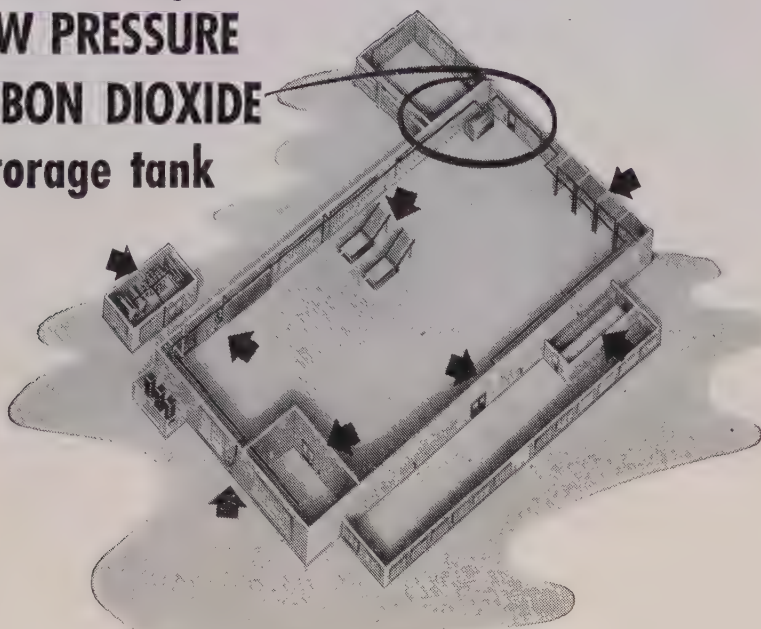
Wherever pipecoils are used, Platecoils will heat faster, can be installed quicker, and will cost less to use. Write today for your copy of Bulletin No. P-72.



PLATECOIL
DIVISION
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

Plant-Wide Fire Protection

from a single
**LOW PRESSURE
CARBON DIOXIDE**
storage tank



Now, your larger size fire hazards can be protected more efficiently at less cost, thanks to C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems. Simple piping, running from one centrally located storage tank, instantly transports clean, non-damaging, non-conducting carbon dioxide anywhere in the plant area ... to flammable liquids, electrical equipment, storage spaces, manufacturing processes and record vaults. Fire at any protected location is extinguished in seconds with an absolute minimum of expense and interruption.

Flexibility is the keynote of these new type C-O-TWO Fire Extinguishing Systems ... the low pressure carbon dioxide storage tanks range in capacities from one to fifty tons ... discharge facilities can either be manual mechanical, manual electric, automatic mechanical, automatic electric or a combination of these ... especially installed to fit your particular needs. Future plant expansion is easily and

economically provided for by initially installing an oversized low pressure carbon dioxide storage tank and adding the supplementary discharge facilities at a later date.

C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems are built with the same superior design and high quality workmanship that have characterized C-O-TWO High Pressure Carbon Dioxide Type Fire Extinguishing Systems for many years. Whether it's fire detecting or fire extinguishing ... portables or built-in systems ... C-O-TWO means experienced engineering that assures you of the best type equipment for the particular fire hazard concerned.

So, with current expensive delayed replacements, why not let an expert C-O-TWO Fire Protection Engineer help you now in planning fully approved fire protection facilities for your various properties. Complete free information and descriptive literature is yours for the asking. Get the facts today!



C-O-TWO FIRE EQUIPMENT COMPANY

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

Affiliated with Pyrene Manufacturing Company

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeeze-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

CALENDAR OF MEETINGS

October 8-13, Concrete Reinforcing Steel Institute: Fall meeting, Grove Park Inn, Asheville, N. C. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Deizell.

October 9-12, The Electrochemical Society Inc.: Centennial—Fall convention, Hotel Statler, Detroit. Society address: 325 W. 102nd St., New York 25. Secretary: Henry B. Linford.

October 10-12, Porcelain Enamel Institute Inc.: Shop practices forum, Deshler-Wallick Hotel, Columbus, O. Institute address: 1010 Vermont Ave. NW, Washington. Secretary: Edward Mackaser.

October 11, American Iron & Steel Institute: Regional technical meeting, Hotel Warwick, Philadelphia. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

October 11-12, Society for Advancement of Management: Chicago Industrial Engineering Conference, Naval Armory, Chicago. Society address: 53 W. Jackson Blvd., Chicago 4. Chairman: Theodore W. Franks.

October 11-12, American Institute of Mining and Metallurgical Engineers & American Society of Mechanical Engineers: Annual fuels conference, Roanoke Hotel, Roanoke, Va. Institute and Society address: 29 W. 39th St., New York 18. Institute secretary: Edward H. Robie; Society secretary: C. E. Davies.

October 12-14, Metal Treating Institute: Annual meeting, Detroit. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

October 13-14, American Society for Metals: Annual seminar, Hotel Statler, Detroit. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 13-17, Packing Machinery Manufacturers Institute: Fall meeting, Mid Pines Club, Southern Pines, N. C. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

October 14-18, American Hardware Manufacturers Association: Fall meeting, Marlborough-Blenheim Hotel, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

October 15-17, American Gas Association: Annual meeting, Kiel Auditorium, St. Louis. Association address: 420 Lexington Ave., New York 18. Secretary: Kurwin R. Boyes.

October 15-18, American Welding Society: Annual meeting, Book-Cadillac Hotel, Detroit. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 15-18, Society for Non-Destructive Testing Inc.: Annual meeting, Hotel Detroit, Detroit. Society address: Box 710, Evanston, Ill. President: W. E. Thomas.

October 15-19, American Society for Metals: National Metal Congress & Exposition, Statler Hotel, Detroit, and Michigan State Fairgrounds. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 15-19, The World Metallurgical Congress: Hotel Statler, Detroit. Sponsored by American Society for Metals. Manager: W. H. Eisenman; director: Dr. Zay Jeffries.

October 15-19, National Association of Manufacturers: Annual institute on industrial relations, Lake Placid Club, Essex County, New York. Association address: 14 W. 49th St., New York 20. Institute director: Sibyl S. Patterson.

October 16-19, Scientific Apparatus Makers Association: Record controller & midyear meeting, Seaview Country Club, Absecon, N. J. Association address: 20 N. Wacker Drive, Chicago 6. President: Kenneth Anderson.

October 17-18, Steel Shipping Container Institute Inc.: Fall meeting, Pierre & Hampshire House, New York. Institute address: 570 Lexington Ave., New York 22. Secretary: L. B. Miller.

October 18-20, Anti-Friction Bearing Manufacturers Association: Fall meeting, The

(Continued on p. 237)

(Continued from p. 236)

Homestead, Hot Springs, Va. Association address: 60 E. 42nd St., New York 17. Secretary-manager: H. O. Smith.

October 18-20, National Association of Corrosion Engineers: Annual meeting, south-central region, Corpus Christi, Tex. Association address: 919 Milam Bldg., Houston 2. Executive secretary: A. B. Campbell; meeting chairman: George A. Mills.

October 19-20, American Society of Tool Engineers: Semi-annual directors' meeting & south-central regional meeting, Vendome Hotel, Evansville, Ind. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

October 22-24, American Mining Congress: 1951 metal and nonmetallic mineral mining convention, Biltmore Hotel, Los Angeles. Congress address: Ring Bldg., Washington 6. Secretary: Julian D. Conover.

October 22-24, American Standards Association: Annual meeting & national standardization conference, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York. Secretary: G. F. Hussey Jr., Adm., USN, Ret.

October 22-24, Packaging Institute: Fall meeting, Commodore Hotel, New York. Institute address: 342 Madison Ave., New York 17. Secretary: Laurence V. Burton.

October 22-25, American Institute of Steel Construction Inc.: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbott Post.

October 22-25, The Wire Association: Annual convention, La Salle Hotel, Chicago. Association address: 300 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

October 22-26, American Association of Electrical Engineers: General fall meeting, Hotel Cleveland, Cleveland. Association address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 25-26, Gray Iron Founders Society Inc.: Fall meeting, Edgewater Beach Hotel, Chicago. Society address: 210 National City—E. 6th St. Bldg., Cleveland. Executive vice president: Donald H. Workman.

October 26-27, American Institute of Mining and Metallurgical Engineers, National Open Hearth Steel Committee: Annual meeting, Southern Ohio section, Deshler Wallick Hotel, Columbus, O. Institute address: 29 W. 39th St., New York 18. Section chairman: V. W. Jones, Armco Steel Corp., Middletown, O.

October 28-30, Conveyor Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: 1129 Vermont Ave., Washington 5. Executive vice president: R. C. Sollenberger.

October 29-31, American Gear Manufacturers Association: Semi-annual meeting, Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

October 29-31, National Lubricating Grease Institute: Fall meeting, Edgewater Beach Hotel, Chicago. Institute address: 4638 Nichols Parkway, Kansas City 2, Mo. Executive secretary: Harry F. Bennetts.

October 31-November 2, Foundry Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: Engineers Bldg., Cleveland 14. Executive director: Arthur J. Tuscany.

October 31-November 2, Porcelain Enamel Institute Inc.: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 1010 Vermont Ave. N.W., Washington 5. Secretary: Edward Mackaser.

NOVEMBER

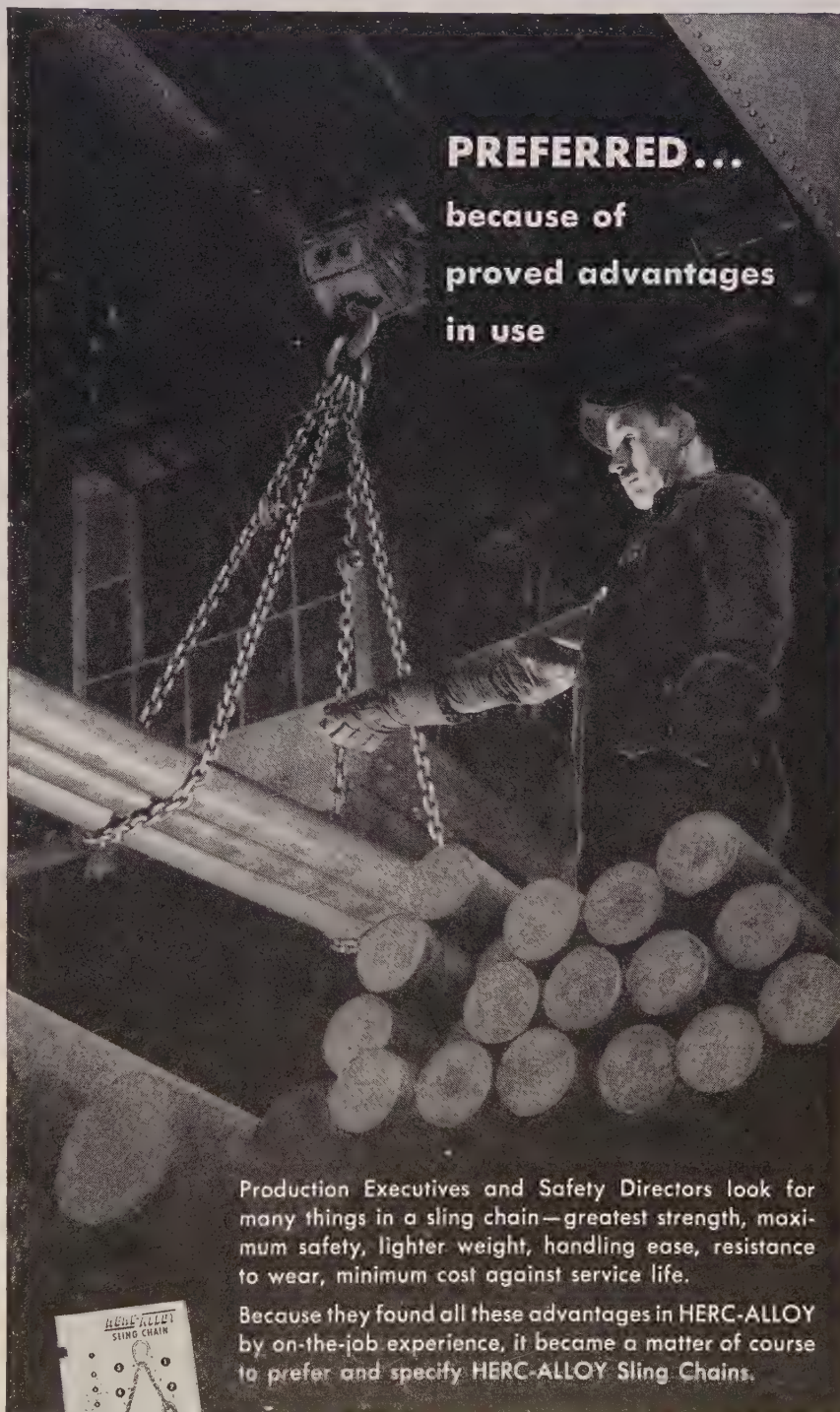
November 1-2, Industrial Management Society: Annual time-motion study and management clinic, Sheraton Hotel, Chicago. Society address: 35 E. Wacker Drive, Chicago 1.

November 1-4, National Tool & Die Manufacturers Association: Annual convention, Statler Hotel, St. Louis. Association address: 906 Public Square Bldg., Cleveland. Executive secretary: George S. Eaton.

HERC-ALLOY

SLING CHAINS

PREFERRED...
because of
proved advantages
in use



Production Executives and Safety Directors look for many things in a sling chain—greatest strength, maximum safety, lighter weight, handling ease, resistance to wear, minimum cost against service life.

Because they found all these advantages in HERC-ALLOY by on-the-job experience, it became a matter of course to prefer and specify HERC-ALLOY Sling Chains.



Write for illustrated Data Book No. 3 which contains helpful information on sling chain selection and use.

COLUMBUS MCKINNON CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corp.)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

District Offices: New York • Chicago • Cleveland

Other Factories at Angola, N. Y., Dixon, Ill., St. Catharines, Ont., Can., and Johannesburg, South Africa.

Typewriter mainspring *redesigned*



New Products and Equipment

Stud Welds at Production Rates

High-speed dual head stud production unit developed by KSM Products Inc., Merchantville, N. J., is suitable for military and civilian application. Unit combines precise fast operation and heavy-duty construction features. In operation, accurate placing of work

Chicago 50, Ill. These machines were originally patented by Mueller Engineering Co., Dearborn, Mich.

Special features contained in the hydraulic cylinder, basic unit of the machine, enable it to be used on a wide variety of jobs. Built-in blank-holding and stripping action, which is entirely automatic and requires no springs, is actuated hydraulically after the power stroke. Rigid construction permits punching holes under difficult conditions, such as when the steel is thicker than hole diameter. Principal features of the hydraulic system include continuous pressure intensification which permits flexibility in adding cylinders in the circuit of the power unit. A patented transfer valve permits handling extremely high pressures while eliminating hydraulic shock in the circuits.

greater capacity and accuracy of control. An oil-relayed governor makes possible speed range up to 6 to 1, with 4 per cent regulation and $\frac{1}{2}$ per cent steady state speed variation.

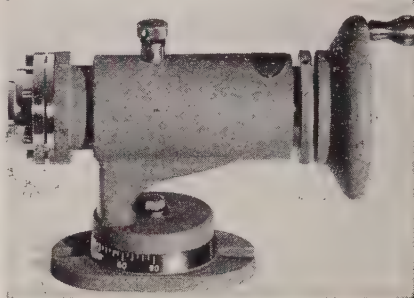
Type DRV, also rated at 200 to 5000 hp, has similar governing characteristics but utilizes automatic sectional valves linked to the oil relay governor to minimize throttling losses under fluctuating load factors. Last of the units, type DRVX, is used where process steam is desired at a definite, steady pressure.

Relief Fixture Speeds Grinding

Relief grinder that speeds all types of cutter grinding operations is announced by Western Aero Industries, 3305 Burton Ave., Burbank, Calif. The fixture handles countersinks of all

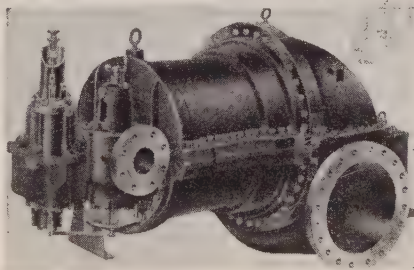
Turbines Rated at 200-5000 hp

Multi-stage, mechanical drive turbines made by General Electric Co., Schenectady 5, N. Y., are available in a line with ratings from 200 to 5000 hp and in four types: DP, DR, DRV and DRVX. Type DP, rated from 200 to 3000 hp, is designed for driving pumps, compressors, fans,

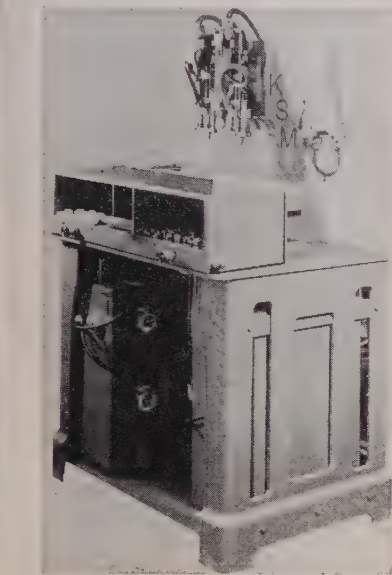
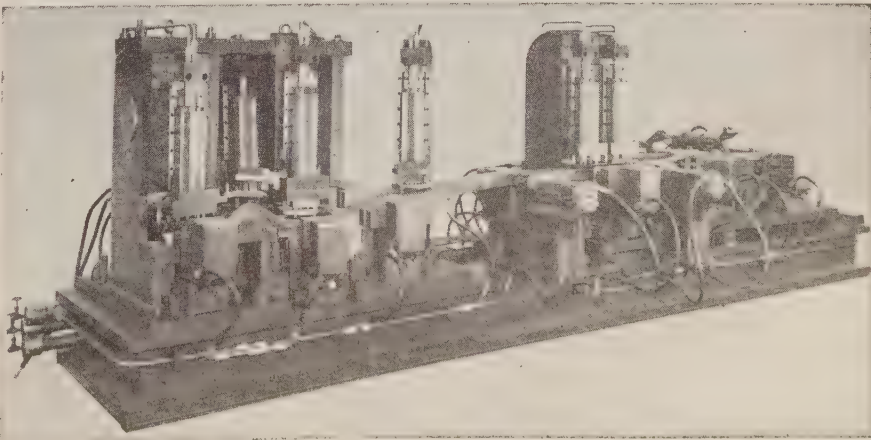


types, center drills, integral pilot cutters, and right or left hand pilot drills. It is designed to operate at maximum efficiency by unskilled help. Two wrenches are needed to adjust for correct relief and angle in relation to the grinding wheel.

Relief unit fits any standard grinder, handling work from $\frac{1}{8}$ to 1 inch in diameter with standard collets. Lift of the single cam is variable from 0.001 to $\frac{1}{8}$ -inch and adjustment pins are provided for 1, 2, 3, 4 and 6-fluted cutter grinding. Housing is made of cast iron and supports a



blowers and similar equipment. Its hydraulic governor provides a 30 per cent speed range and 6 per cent speed regulation. Type DR, rated from 200 to 5000 hp, has wider speed range,



in V holder is insured by built-in microswitch which prevents operation if work is not correctly located. After loading suspension button and arc shield into each of the two welding heads and placing work in V holder, operator presses the two start buttons at front of unit. The unit then automatically completes the operation.

Special features of the production unit include: Automatic clamping device to prevent movement of work; leader pin guides to insure accurate positioning of the work in relation to welding heads; and automatic spark shield which raises up in front of welding heads prior to welding to protect operator from possible flash or splatter. Capacity of the unit is eight welds per minute.

Multiple Hole Piercing

Hydraulic machines for the simultaneous piercing of all holes and the trimming of automotive frame members, production riveting assembly operations on automotive frame and producing accurately pierced holes and related assembly operations for jet engine components are being manufactured by Danly Machine Specialties Inc., 2100 S. Laramie Ave.,

hardened and ground spindle on two large bearing surfaces. Cam is hardened tool steel with steel adjustment pins. Fixture swings 90 degrees to the right or left; base is calibrated in 5-degree increments.

Motor Has Direct Mounting

Hydraulic pump motor, developed by Reuland Electric Co., Alhambra, Calif., features a system of direct endbell mounting between pump and motor. This system is standardized and is adaptable to all makes of pumps. Primary benefit of mounting

technique is assurance of precision alignment in every installation. All motors are supplied with machined endbell flanges, pre-engineered to fit the registers on pump mounting flange.

Reduction in overall installation costs is effected by bolting the two flanges together, thus eliminating separate mounting and alignment of each unit as well as fabrication of special mounting platforms for raising the impeller shaft to drive shaft height. Motors are supplied with pump flange mount on one or both endbells

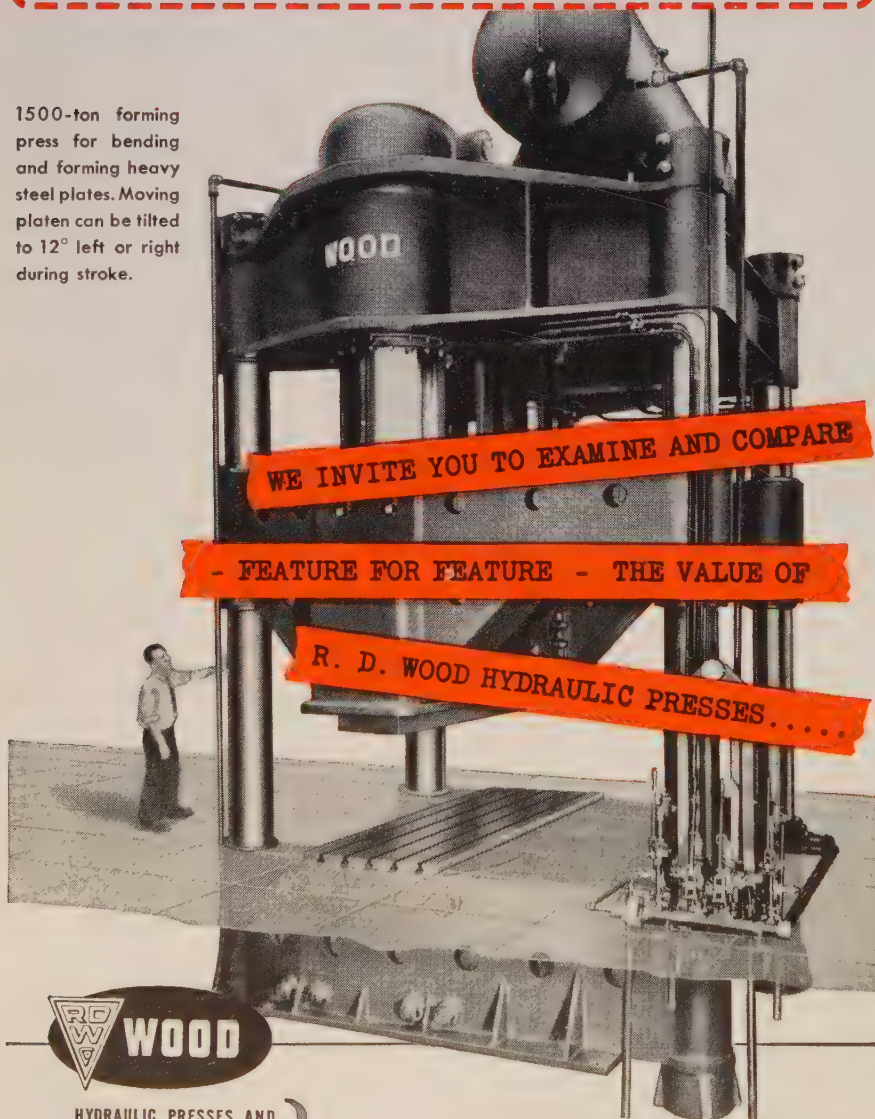
in all standard ratings of horsepower and speed.

Clamp Truck Tiers Crates, Boxes

Automatic clamp attachment for industrial lift trucks that tier crated and boxed products without use of pallets is offered by Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. The clamp is hydraulically operated, handling two objects up to 75 inches high and 36 inches wide each, stacking them as high as 17 feet simul-

If it's an **R. D. WOOD**... *It's Good**

1500-ton forming press for bending and forming heavy steel plates. Moving platen can be tilted to 12° left or right during stroke.



HYDRAULIC PRESSES AND
VALVES FOR EVERY PURPOSE
ACCUMULATORS
ALLEVATORS
INTENSIFIERS

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING, PHILA. 5, PA.

Established 1803

*Find out why. Send for your free copy of our new photographic book of plant facilities.



taneously. The device is available for any capacity Yale gasoline or electric truck.

A space saver, truck is equipped with hydraulic side shifter that permits load and clamp to be shifted 4 inches to either side of the center. This enables close, accurate spotting of the load to save space next to wall. Short length of forks indicates an advantage in loading of freight cars, where again the side shifter permits use of space near walls.

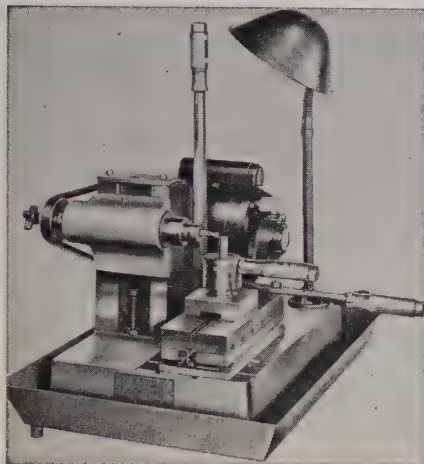
Upright Precision Drills

Cosa Corp., 405 Lexington Ave., New York 17, N. Y., is introducing the Alzmetall line of high-powered upright precision drills in the United States. Machines are made in three sizes, in which infinitely variable speed drives range from 105-1450, 90-900 and 40-800 rpm, respectively. Range of drilling capacities for cast iron is 15/16 to 2-5/16 inches; for steel, 13/16 to 2 inches. Smallest machine has a No. 3 Morse taper spindle, the two larger types have spindles with No. 4 Morse tapers. All three machines have a light mounted on the underside of the head.

The larger drills have adjustable automatic depth releases and can be equipped with coolant and tapping attachments.

Machine Turns, Mills, Grinds

Combination bench-type production machine that turns, mills or grinds is introduced by Viking Industries, 220 Montague St., Rockford, Ill. It features a common base, power unit, spindle and vertical and horizontal slides to which special tooling and fixtures are added for the desired type of operation. A complete set of tooling is available for its conversion,



or machines are furnished as single-purpose units. Coolant system is optional.

Spindle speeds with standard pulleys are 825 and 3450 rpm. An additional range of speeds from 100 to 7000 rpm is optional. One-inch spindle with No. 7 taper hole is mounted in heavy ball bearings; through hole is $\frac{1}{8}$ -inch in diameter. Spindle is adjustable vertically with maximum 7-inch distance from centerline to work table surface. Overall bench space required is 11 x 18 inches, while table working surface of 6 x 9½ inches is provided.

Radial Drilling Machine

Radial drilling machine with 9-inch column made by Midgley & Sutcliffe of Leeds, England, is offered by British Industries Corp., 164 Duane St., New York 13, N. Y. The 9-inch column, extremely rigid and comprised of a single unit, is accurately machined and ground to receive the arm and roller bearings for the rotating motion. Saddle is mounted on needle roller bearings and moves freely by finger pressure.

Constant speed 2 hp reversing motor, flange-mounted directly on top of saddle, provides drive. There are

OUT OUR WAY



More for the money
made it sales leader

SOL-SPEEDI-DRI

It's no accident when a product leads its field. SOL-SPEEDI-DRI is—and always has been—America's largest selling oil and grease absorbent. Big users and independent laboratories have tested it. We are constantly testing it. All factors considered, SOL-SPEEDI-DRI gives you *more for your money*. Send coupon today for free sample and brochure about how to keep *your* floors clean and slip-proof with SOL-SPEEDI-DRI!

SPEEDI-DRI CORP., 210 W. Washington Sq., Philadelphia 5, Pa.



Warehouse stocks maintained in principal cities of the United States and Canada.

Inquirers in New York, New England, and New Jersey should write to Speedi-Dri Corp. Elsewhere in U.S. to Waverly Petroleum Products Co., 1724 Chestnut St., Phila. 3, Pa.

FREE SAMPLE: Fill out the coupon and mail today for big, free sample and brochure.

Name _____

Address _____

City _____

S-10-51

State _____



THE STANDARD

GIVES

NOTICE: DESIGN AND PURCHASING DEPARTMENTS

Standard's three-unit mills—each composed of a horizontal mill and two steam hammers for preliminary operations—can roll practically all sizes of rings up to a maximum of 12-feet outside diameter. Let us quote on your requirements.

Standard Weldless Ring Blank, rolled to close tolerances for conversion to a table rack spiral bevel ring gear for a boring mill.

STANDARDIZE ON STANDARD FOR

WHEEL MILL PRODUCTS,

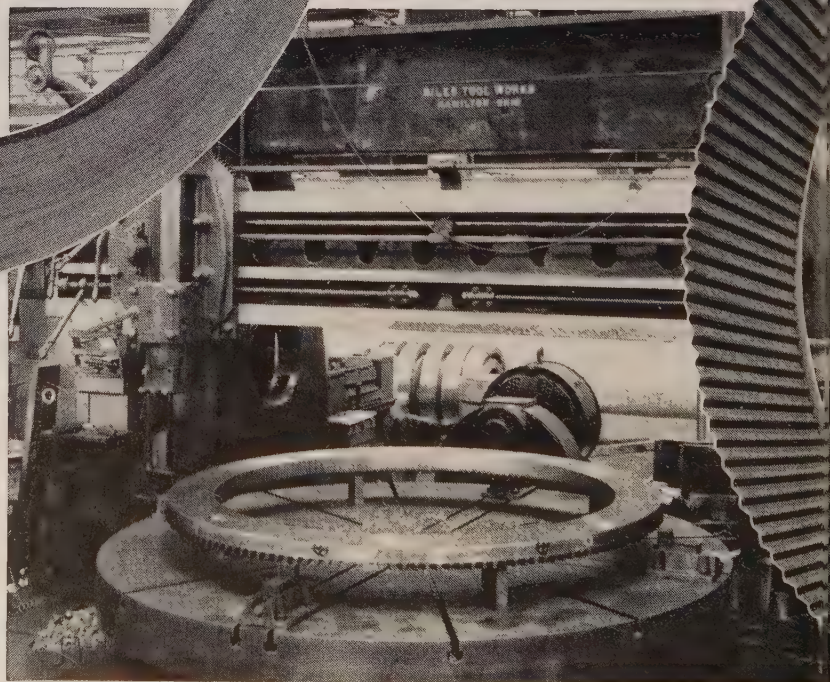


STEEL CASTINGS,

WELDLESS RINGS,

FORGINGS,

FLANGES.



Finish-machining the ring gear on a Niles vertical boring mill. Teeth have already been cut.



BALDWIN

STEEL WORKS ROLLED GEAR BLANK

THIS RING GEAR

a better start in life

The finished ring gear. Uniform metal structure assures high precision in gear tooth form and dimension.

The job of the table-rack spiral bevel ring gear on a modern boring mill is rough, rugged and responsible—and the only way to get the essential physical properties *in the gear* is to have them *in the blank*. Strength—to take the stress and strain of high-speed production with deep-cutting carbide tools. Uniform structure—to permit the precision machining that is the basis of precision operation. Accuracy in dimension—to save machining time and waste.

Standard Steel Works blanks meet every requirement. Starting with steel produced in Standard's own open-hearth furnaces, the rings are rolled to close tolerances to develop every desirable property inherent in the metal . . . heat treated to further improve service characteristics. If you have a ring-gear problem, Standard blanks may provide the solution you are looking for. You'll find Standard an ideal supplier—big enough to handle the most demanding jobs . . . small enough to make every job a matter of direct personal concern.

STANDARD STEEL WORKS DIVISION

Burnham, Mifflin Township, Pennsylvania

BALDWIN-LIMA-HAMILTON CORPORATION

Philadelphia 42, Pa. • Offices in Principal Cities

Niles 10-foot hydraulic feed vertical boring mill; table is driven by the gear shown. This is a high-production machine, for use with carbide tools—which calls for high strength in the drive gear.

-LIMA-HAMILTON

accurate
fit

fins are no problem
when you teem into a

SHENANGO-PENN MOLD

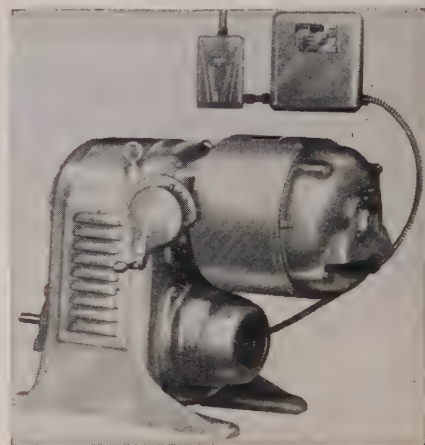
SHENANGO-PENN MOLD COMPANY OLIVER BUILDING PITTSBURGH, PENNA.

NEW PRODUCTS and EQUIPMENT

nine rates of spindle speeds obtainable through two conveniently positioned levers. Automatic depth trip for knocking off any predetermined depth of hole is fitted. Table can be supplied in either rigid or swivel types.

Motors Have Controlled Braking

Fast, controlled braking of its Veridrive motors is a development of U. S. Electrical Motors Inc., 200 East Slauson Ave., Los Angeles 54, Calif. Brake is mounted directly on the variable speed shaft to eliminate transmission of braking action through the belt. Ideal for inching or jogging,



it offers shockless operation, producing a constantly increasing torque during stopping. Unlike the solenoid brake, its frictional force is controlled directly by the magnetic action.

Permanent braking torque is an aid in applications demanding accurate regulation. Adjustment for installations requiring diversified braking torque is made through a knob-controlled rheostat. Brake used is the Warner type ICB, adaptable to both Veridrive and Veridrive-Synchro-gears. It is direct current-actuated with a maximum 25-35 watt power requirement.

Driller Performs 18 Operations

An automatic drilling machine developed by National Automatic Tool Co., Richmond, Ind., performs 18 operations on 180 cylinder blocks per hour. Operations include drilling holes from 0.9375 to 0.0625-inch, diameter, rough boring, facing, chamfering, milling, rough and finish reaming. The machine is station-type, has a 65-inch diameter six position automatic index rotating table and a center column of auxiliary horizontal units.

Seven fixed - center gear - driven heads contain 52 standard drilling

Molding Machines

New Bulletin describes SPO line of Jolt Pin Lifters



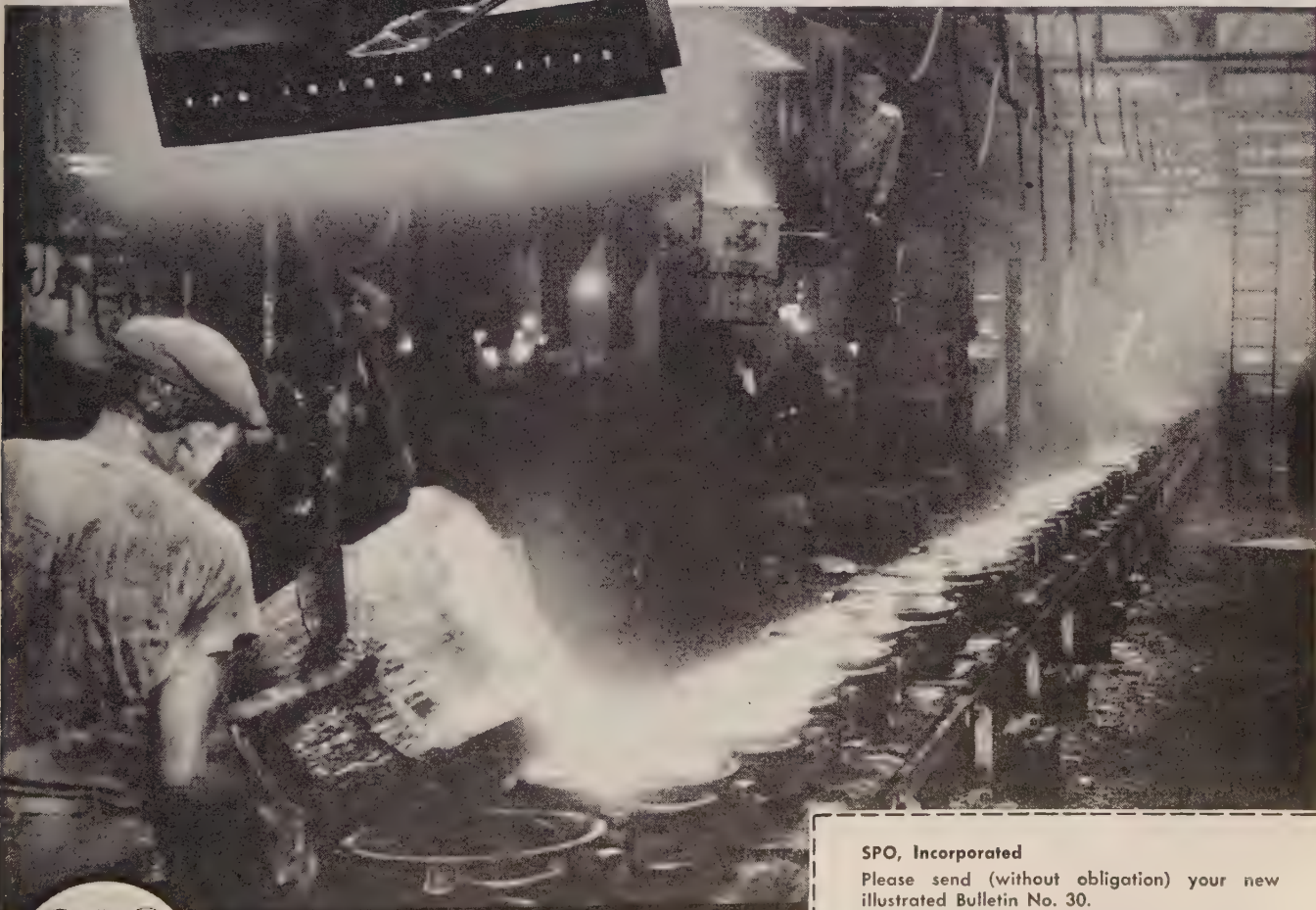
Complete data on the Series 3000 high-production jolt pin lifters are presented in this new illustrated catalog which is available to foundry management and purchasing personnel such as superintendents, foremen, production expeditors, etc. Designed for maximum speed, safety and ease of operation, these machines feature the patented SPO "inverted jolt" mechanism.

The jolt pin lifters described in this publication have jolt capacities ranging from 750 to 4000 pounds and are fully adjustable to meet diversified production demands. Pivot type adjustable lifting pins will accommodate any type or size of flask within their capacities. Both breakaway and secondary draw speeds can be adjusted to different job requirements, and jolt impact intensity of each machine is variable.

In this catalog, dimensions, capacities, pattern draw, SPO vibrator size and other pertinent data are tabulated for quick reference. Photographs and line drawings depict the construction and features of the various machines.

Bulletin No. 30 will be sent upon receipt of coupon or letter-head request.

129-S1



INCORPORATED

6495 GRAND DIVISION AVE., • CLEVELAND 5, OHIO

SPO, Incorporated

Please send (without obligation) your new illustrated Bulletin No. 30.

Name _____

Address _____

Town _____ State _____

spindles mounted in antifriction bearings and provided with nose adjustment wherever centers will permit. Special milling head contains two milling spindles. A six position fixture is arranged to accommodate two cylinder blocks in each of the positions.

Simplicity, Accuracy Mark Gage

Measurements to tolerances as fine as 0.00005-inch anywhere in a 3-inch length are obtainable on a universal depth gage introduced by Saart, Kraemer and Hanscom Inc., 1

Washington Ave., Providence 5, R. I. Indicated tolerance may be taken in measurement of depth, length, angles or steps. Size of the reference plate is $3\frac{1}{4} \times 4$ inches, weight is approximately 7 pounds. Reference plate and edges are finish ground and electrolized for wear and corrosion resistance. Alloy has a 79-81 Rockwell C hardness value. Company designation is model DP-56-R 1.

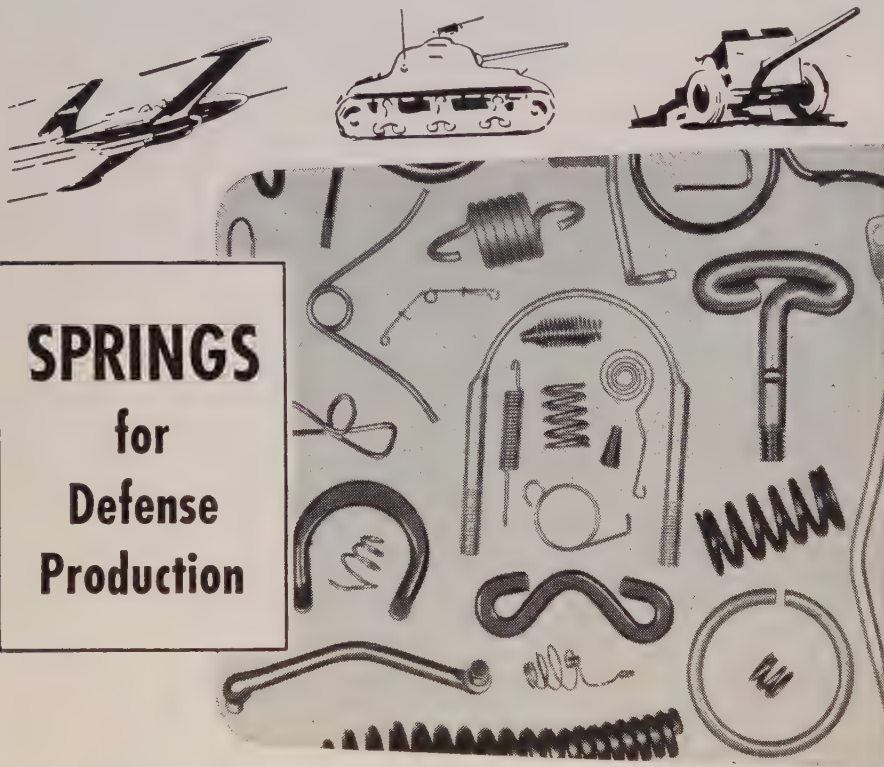
Press Feeding, Sans Operator

Punch press loader that removes the operator from his press feed job

and increases press speeds on redraw operation by 10 to 60 per cent over hand feeding, is offered by Magnaflux Corp., 5900 Northwest Highway, Chicago 31, Ill.

Feeder has mechanical fingers that pick up parts after first draw, and feed one or more consecutive redraw presses at speeds up to 1200 parts per hour. Similar fingers remove the parts from the press to feed them on another conveyor to further press operations. Complete operation cycle is regulated by the feeder's speed adjustment.

At the proper point after loading, press is tripped by the feeder, with

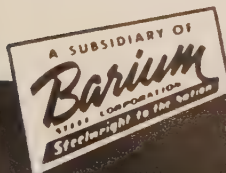


SPRINGS for Defense Production

IF YOU NEED ROUND OR FLAT STEEL SPRINGS, parts, assemblies or stampings for defense equipment, Cuyahoga's experience and facilities for applying spring and wire design to defense applications are available to prime and sub-contractors.

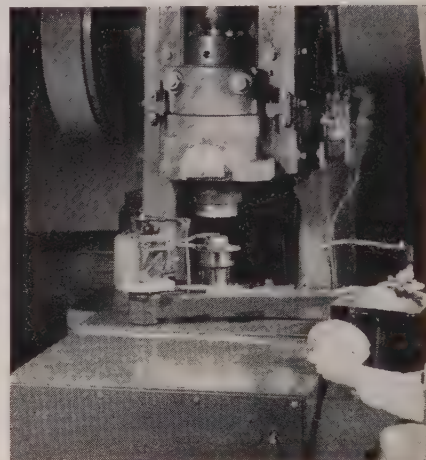
We are experienced suppliers to the automotive, aircraft, ordinance, electrical, appliance and many other industries where assembly problems occur.

Send Us Your Inquiries



The CUYAHOGA SPRING Co.

10200 BEREA ROAD • CLEVELAND 2, OHIO



either electric or air triggering. If the part is not removed from the die, a safety circuit stops both feeder and press. If parts are not being loaded to the die, memory circuit will continue to operate the press and feeder, avoiding shutdowns. After any shutdown the circuit starts the machine at the point of interruption. Mechanical fingers are designed for parts to be handled, and are held in chucks for quick change between press runs.

Cold Rolling Chipless Threads

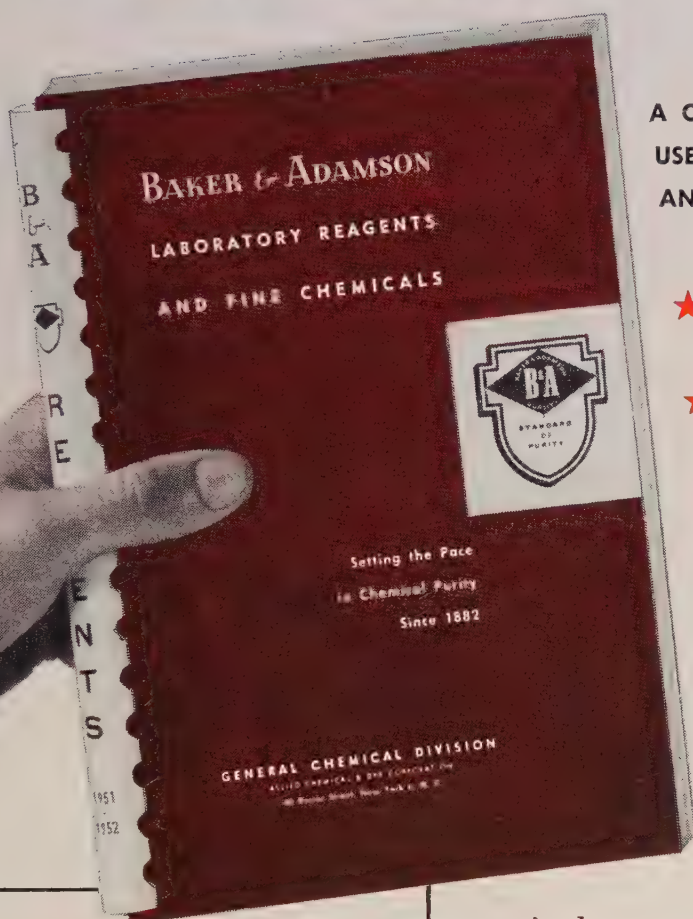
Carl Hirschmann Co., 30 Park Ave., Manhasset, N. Y., U. S. representative for S. A. Thommen, Waldenburg, Switzerland, is offering the Thommen G-45 thread rolling machine for cold rolling chipless threads. Machine is designed to handle 120 to 1500 pieces per hour, depending on kind of metal and size of thread. It cold rolls chipless threads of high precision in standard and special steel including molybdenum, chrome-nickel and stainless and most of the nonferrous metals.

Maximum pressure is 13,230 pounds; thread diameters range from $5/64$ to $1-57/64$ inch; thread rolling pitch is 0.016 to $5/32$ inch; and maximum length to be rolled is set at $2-23/64$.

Announcing...

THE BIG NEW 1951-52

B & A CATALOG of Reagents & Fine Chemicals



A COMPLETE BUYERS' GUIDE FOR
USERS OF LABORATORY REAGENTS
AND FINE CHEMICALS

- ★ For Manufacturing Control Laboratories
- ★ For Production Requiring Quality Chemicals
- ★ For Process Planning and Development
- ★ For Research Laboratories
- ★ For Educational Laboratories

Just off the press—Baker & Adamson's new 1951-52 Catalog is profusely illustrated . . . packed with 264 pages of important information. Gives clear, concise data on over 1,000 B&A Laboratory Reagents and Fine Chemicals! Includes such pertinent facts as grades, strengths, maximum limits of impurities, etc. If you buy or specify laboratory reagents, this new 1951-52 B&A Catalog belongs on your desk. Send for your copy today.

Packed with helpful information

STORAGE AND HANDLING: Special section gives helpful "do's and don'ts" on handling chemicals that require extra precautions.

PACKAGING SECTION: Exclusive new feature—photographs and full details on major B&A packaging, including: . . . the "PBL" Drum with polyethylene liner, the 9-bottle case for reagent acids, the 6-½ gallon carboy, the "Saftepak" plastic dispenser for HF, and many others.

EXTENSIVE DATA: Over 230 pages of specifications, other pertinent data on B&A Reagents, also on many Fine Chemicals.

**Write
Today**

Fill out coupon, attach to your business letterhead and mail today. Free to all qualified users and buyers of reagents.

BAKER & ADAMSON PRODUCTS, General Chemical Division
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Please send me your new 264 page catalog of Baker & Adamson Reagents and Fine Chemicals for 1951-52.

Name _____

Organization _____ Position _____

Address _____

City _____ Zone _____ State _____

19-10



No. 1551-N3
3/4 Inch Neutral
Position 3-Way
Air Valve

HAND OPERATED Air Valves

Thousands of Uses Throughout Industry

● Universally used and endorsed. Valving mechanism has stainless steel body and push-pull rods, brass sleeves, self-sealing U-packers and many other refinements, all fully enclosed against dirt, assuring long efficient trouble-free operation. No metal to metal seating. 3/8" to 1 1/2" sizes, 3-way and 4-way, neutral position and regular actions. Pipe header mounting plates furnished if desired. *Write for full details.*



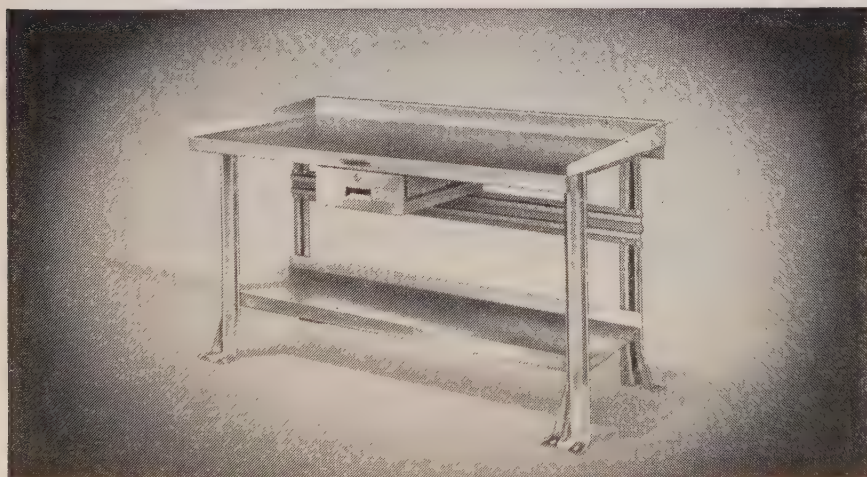
Quick-As-Wink

AIR AND HYDRAULIC

Control Valves

Hand, Foot, Cam, Pilot, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1928 East Pershing St., Salem, Ohio



THE HALLOWELL[®] WORK BENCH OF STEEL

Standardized, ready-made HALLOWELL Work Benches save trouble and expense of "building your own"; provide superior equipment for maximum productivity.

Interchangeable units readily adaptable to individual requirement. Easily bolted together to form continuous bench, yet may be taken down and reassembled as single units. Rigid, heavy-duty construction eliminates bolting to the floor, minimizes installation and maintenance.

HALLOWELL Work Benches do credit to any plant. Functional design and attractive appearance encourage better plant housekeeping and worker performance.

Full details in Bulletin 701-1.

SHOP EQUIPMENT **HALLOWELL[®]** OF STEEL

Ready-Made, Standardized

-SPS STANDARD PRESSED STEEL CO.

JENKINTOWN 33, PENNSYLVANIA

inches. Maximum hardness is 170,000 psi and the minimum elongation is 12 to 8 per cent.

Grinder Eliminates Traverse Bed

Elimination of traverse bed common to conventional traveling head grinders is a feature of the Mercury series E-20 grinders offered by Mercury Engineering Corp., 2100 N. Farwell Ave., Milwaukee 2, Wis. Designed for grinding armor plates, it offers opportunities in grinding edges, angular surfaces, compounds and bev-



els as well as machining pads on heavy castings 20 feet or longer. The grinder runs along rails on self-powered precision rollers equipped with built-in leveling devices. The series has a 20-inch face-type grinding wheel mounted on a head which tilts from horizontal to full vertical. Two or more grinders can operate simultaneously on a single set of rails.

Twenty hp motor and heavy duty precision spindle assembly are mounted within rigid trunnions and arranged to feed in and out through a 7-inch range. A planetary gear driven motor reducer is used in combination with precision lead screw,

Feeding Rate Equals Load

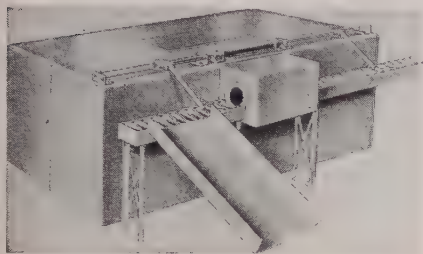
Accurate adjustment of coal-feeding rate to exact load demand is achieved by Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland, O., through use of its infinitely variable transmission on the company's Coal Flow stoker series. Featured on both the CF and PCF series, the variable drive is particularly suited for use with modulated type combustion controls. Maximum accessibility for servicing is achieved by mounting the unit above the conveyor work. This

also reduces possibility of damage resulting from flooded pits and boiler rooms. An automatic overload device and torque indicator of spring scale accuracy are built into the transmission.

Furnace Gives Uniform Heat

Loftus Engineering Corp., 610 Smithfield St., Pittsburgh, Pa., offers a 60 cycle induction furnace for heating nonferrous metals and some applications of steel.

The furnace provides absolute uniformity of heating and at the same time assures balanced electrical loading from three phase line. To accom-



plish this, the transformer converts balanced three-phase power into two phase operation.

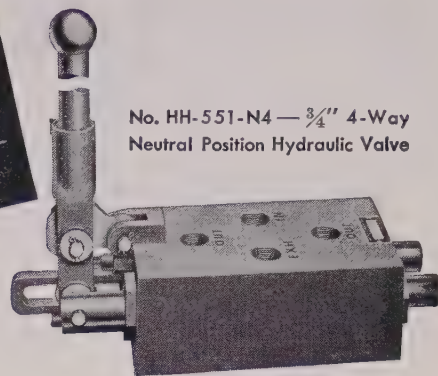
Two closely interlaid coils, leading off the two phase line, surround the billet and provide characteristics of uniformity and thorough penetration of single phase heating. Large eddy currents flow in the billet to be heated, insuring fast, clean and uniform heat for forging extrusion and rolling. Furnace is built to customer's specification, designed for any size or shape of billet.

Maintenance, Production Welder

Airco model MCM 200 ampere transformer welder, designed for general maintenance and production welding, is offered by Air Reduction Co., 60 E. 42nd St., New York 17, N. Y. The model has a full 200-amp, 50 per cent duty cycle. Four variations are available: A 220 volt or a 220/440/550 volt unit, each with or without power factor correction. Two open circuit voltages are provided—80 volts on the low range, 55 volts on the high range. This combines easy arc starting with a lower kva demand load and primary ampere current. Absence of moving parts keeps maintenance costs low.

Cam Grinder Improved

Tapers required on some automotive cam contours are produced automatically at normal production efficiency as a result of improvements



No. HH-551-N4 — $\frac{3}{4}$ " 4-Way Neutral Position Hydraulic Valve

LEVER OPERATED Hydraulic Valve

For water or oil hydraulic systems to 5000 p. s. i.

● Unsurpassed for efficient trouble-free service controlling double acting hydraulic cylinders and other important high pressure hydraulic circuits. Positive, fast acting. All parts are in pressure balance, eliminating any tendency to creep or crawl. Machined steel housing, chrome plated and polished stainless steel plungers. Self sealing U-packers. Metal valving rings take the impingement of the liquid, preventing wear on the packings. $\frac{1}{2}$ " to $1\frac{1}{2}$ " sizes. Available also in pilot operated designs up to 4". Write for full details.



Quick-As-Wink

AIR AND HYDRAULIC

Control Valves

Hand, Foot, Cam, Pilot, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1922 East Pershing St., Salem, Ohio

When **PRODUCTION**
hangs by a "Thread"...

specify the wire rope that gives the greatest service. "HERCULES" (Red-Strand) Preformed spools more evenly—bends more smoothly. Handles more safely. Splices more easily. Far fewer replacements are needed.

Engineered to reduce internal tension and twisting, "HERCULES" (Red-Strand) Preformed stays on the job—in the groove.

For uninterrupted production, there is only one right rope... be sure to select the correct size and type.

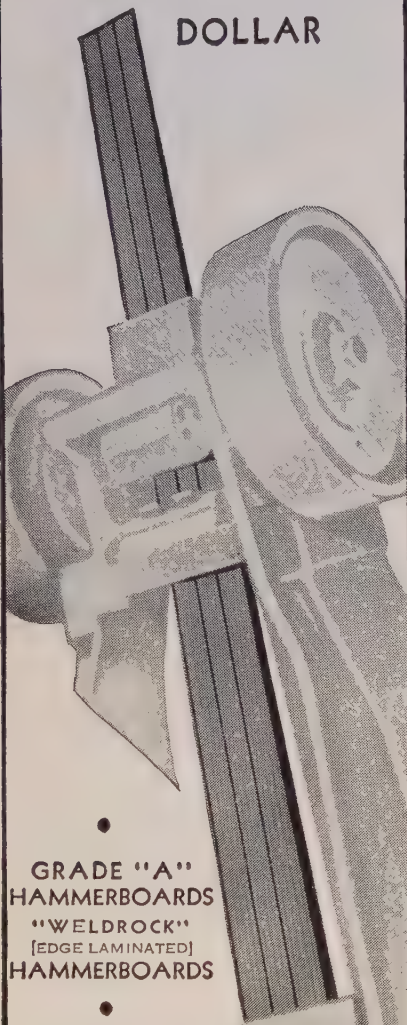


LESCHEN WIRE ROPE

Feel free to consult our Engineering Department at any time for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis, Missouri. Warehouses and branch offices in all principal cities.

IRWIN

MORE FORGINGS
per
HAMMERBOARD
DOLLAR



GRADE "A"
HAMMERBOARDS
"WELDRACK"
[EDGE LAMINATED]
HAMMERBOARDS

RELEASE PINS
HELVES

Anything required in
quantity from
Pennsylvania's
hard woods—
maple and cherry

IRWIN

IRWIN
50 YEARS
of Quality

MANUFACTURING CO., INC.
GARLAND, PA.

Distributed by

JOHN H. SIPCHEN CO.
549 Washington Blvd., Chicago, Ill.

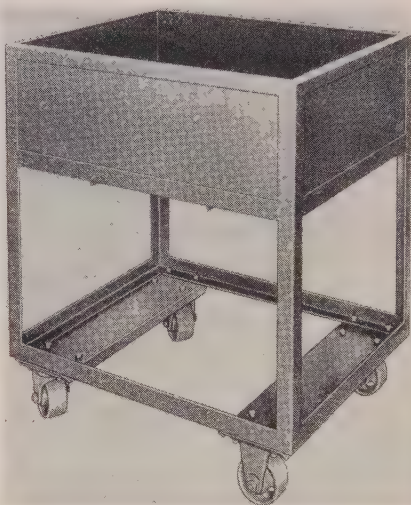
FRANK G. SHAUB

14456 Scripps Ave., Detroit, Mich.
BRETT'S PATENT LIFTER CO., LTD.
Foleshill Works • Coventry, England

made on its No. 2 automatic hydraulic cam grinding machine by Norton Co., Worcester 6, Mass. Tapers in either direction, or in both directions on the same shaft, are speedily produced through these modifications. Provision is made for grinding straight faced cams whether machine is arranged for grinding tapers in one or both directions. Company designation for the machine is Cam-O-Matic.

Shallow Bed Floor Trucks

Shallow bed floor trucks, in a line called the Universal Stock Toter, are offered by Industrial Engineering & Mfg. Co. Inc., Brimfield, Ind. Truck maneuvers easily, is designed for numerous jobs such as line and machine



stocking, moving work parts, or conveying smaller parts in stockroom or shipping department. It places work at normal operating elevation.

Frame is 1½ x 1½ x 3/16-inch angle iron; container sides and bottom are 12-gage sheet. Unit is also furnished with sides and bottom 13-15 gage, ¾ mesh expanded metal. Casters may be 4 or 5-inch semi-steel or fiber, swivel-type at one end, rigid at the other. Container is 30 x 24 x 10 inches deep; height, 34½-inch with 4-inch casters. Lower shelf attached to frame just above casters is optional.

Metal Cutting Band Saw

Heavy-duty cutting band saw, model 1220, made by Machine Tool Division, Kalamazoo Tank and Silo Co., Kalamazoo, Mich., was developed by Harley Earl Corp., Detroit industrial designers, in co-operation with Kalamazoo engineers and production men. The saw takes 12-inch rounds, and flat stock up to 12 x 20 inches. Machine is produced in two models, S and C, identical except for coolant

PAGE WIRE

ROUND

FLAT

OR

SHAPED

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON

**You draw the Shape
—Page can draw
the Wire**

—the way you want it
for your production—whether
it's ALL of your product,
or only a part.

Cross-sectional areas up
to .250" square; widths to ¾";
width-to-thickness ratio
not exceeding 6 to 1.

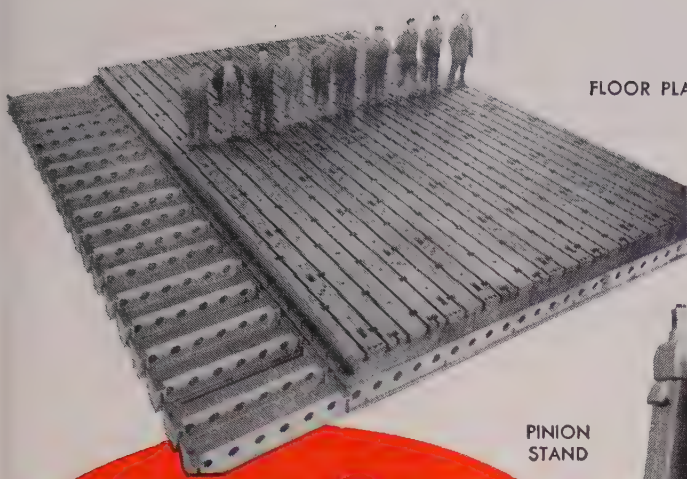
**for Wire or
Information about Wire—**

*Get in touch
with Page!*

ACCO

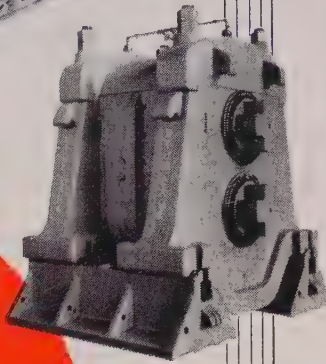
Monessen, Pa., Atlanta, Chicago,
Denver, Detroit, Los Angeles,
New York, Philadelphia, Portland,
San Francisco, Bridgeport, Conn.

**PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE**



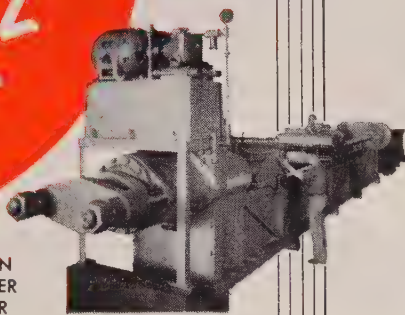
FLOOR PLATE

PINION
STAND

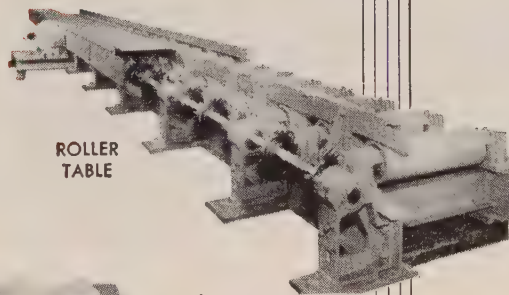


Hyde Park ROLLS AND ROLLING MILL EQUIPMENT

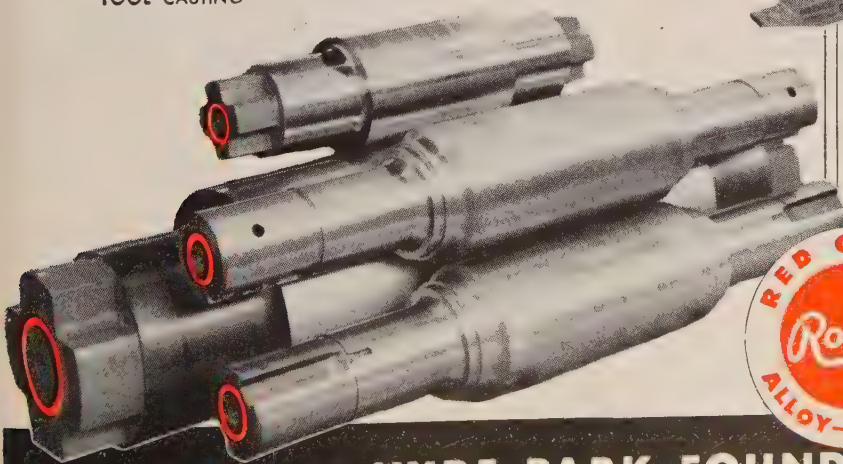
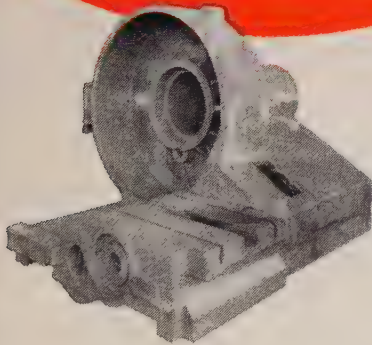
500 TON
STRETCHER
LEVELLER



ROLLER
TABLE



HEAVY MACHINE
TOOL CASTING



FOR over fifty years Hyde Park has had the privilege of making Rolls and Rolling Mill Machinery for many of the leading mills of the nation.

Hyde Park Red Circle Rolls lead in dependable performance and long service. There is a Red Circle Roll for every purpose.

Hyde Park Rolling Mill Equipment saves maintenance costs through higher sustained efficiency.

ROLLS

- Alloy Iron
- Chilled Iron
- Sand and Chilled Iron

ROLLING MILL EQUIPMENT

- Bar Mills
- Merchant Mills
- Sheet and Strip Mills
- Pinion Stands
- Roller Tables
- Reduction Drives
- Stretcher Levellers
- Guillotine Shears
- Sheet Mill Shears
- Roll Lathes
- Special Machinery
- Machine Work

GRAY IRON CASTINGS Up To 80,000 Lbs.

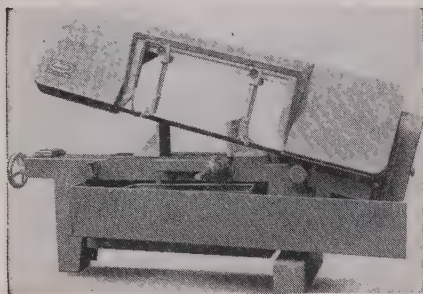
- Machinery Castings
- Lathe Beds
- Housings
- Pinion Housings
- Mill Housings
- Shoe Plate
- Lay-out Plates
- Surface Plates

HYDE PARK FOUNDRY & MACHINE CO.

HYDE PARK, WESTMORELAND CO., PA.

equipment included on the model C. It cuts to an accuracy of a few thousandths with no burr and minimum kerf.

Four cutting speeds—61, 108, 1065 and 259 fpm—are provided by a four-step cone pulley on the motor and drive shaft. This gives wider



choice in matching cutting speed to material and cut size. Frame counterbalance is adjusted by a cam device that has five different spring tensions. Tripod legs assure firm setting on any floor.

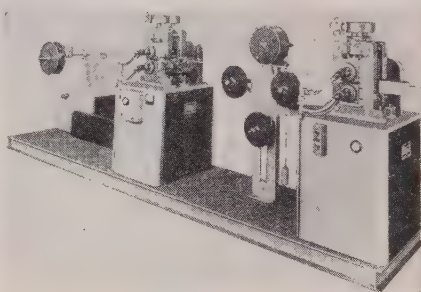
Plater Has Plexiglas Cylinder

Mercil portable-type plating apparatus with Plexiglas cylinder is a development of Hanson-Van Winkle-Munning Co., Matawan, N. J. Equipment is designed to process small

parts efficiently, is made with cylinders 6 inches diameter by 12 inches long OD and 8 inches diameter by 18 inches long OD. Cylinder, legs and gears are of Plexiglas; motor is 1/15 hp, suitable for operation on 110 or 220 v, single phase, 60-cycle power circuit. It can be used in either acid or alkaline solutions, providing bath temperature does not exceed 180-185° F. A rheostat included makes operation of cylinder at various speeds possible.

Wire Rolling Mill

High speed, 2-stand wire rolling mill designed for flattening round and other types of wire, is offered by Stanat Mfg. Co., 47-28 37th St.,



Long Island City 1, N. Y. Roll size is 6 inches diameter by 4 inches face

width. Mill operates on a variable voltage principle, its two motors receiving power from a single ac generator. Manually operated rheostat, placed conveniently on the second mill, accelerates and decelerates both motors simultaneously. Synchronization of motors is done by a dancer roll rheostat.

Housings are made of Meehanite. The rolls are water cooled and run on full length roller bearings with separate thrust bearings. Adjustment is done with hardened and round feed screws, that connect to the single hand wheel through worm gearing. Edging rolls run on tapered roller bearings and have a quick release handle for easy threading of the wire. Floor space occupied is approximately 5 x 15 feet.

Deep Hole Drilling Oil

For deep hole drilling and boring in metals, Conner Tool & Cutter Co., Detroit 3, Mich., introduces deep hole drilling oil. When used with a high pressure pump, it is claimed to give superior chip flushing action, constantly uniform chip formation, effective cooling of tool and work and increased production through faster metal removal and less shutdown time.

Screwdriver and Nut Setter

Model 7500 air-powered screwdriver and nut setter, designed with a pushbutton control that provides instantaneous reverse action, is announced by Aro Equipment Corp., Bryan, O. Tool has an adjustable clutch that can be preset to correct torque requirements. Clutch jaws automatically disengage when screw is set to desired tension.

Motor Generator Set

A mono-coil high frequency motor generator set built by Electric Machinery Mfg. Co., Minneapolis, Minn., is used to convert 60 cycle current to 180 cycle and 360 cycle frequencies. These self-exciting sets are particularly useful in plants using high-cycle automatic electric hand tools.

For Office Photocopying

Redesigned for speed and accuracy in office photocopying, a Record Dexigraph camera is introduced by Remington Rand Inc., New York, N. Y. Using precut paper, it photographs documents at any reduction from 100 per cent to 50 per cent of original size on a continuous percentage scale. Up to 150 exposures in an hour may be made by synchronized operation



**Continuous
Production
FURNACES**



For every annealing, heating and heat treating requirement

You'll get the utmost uniformity of finished product week after week with an EF continuous production furnace. Available in chain belt, wire mesh belt, pusher tray, bulkhead tray, reciprocating, roller rail, roller hearth and other types;—gas fired—oil fired, or electrically heated, whichever suits your particular job and locality best.

Our wide experience in building batch and continuous furnaces is your assurance of high hourly outputs and low cost, trouble-free operation. Let EF engineers work with you on your next job.

Gas-Fired, Oil-Fired and Electric Furnaces
for any Process, Product or Production

THE ELECTRIC FURNACE CO.

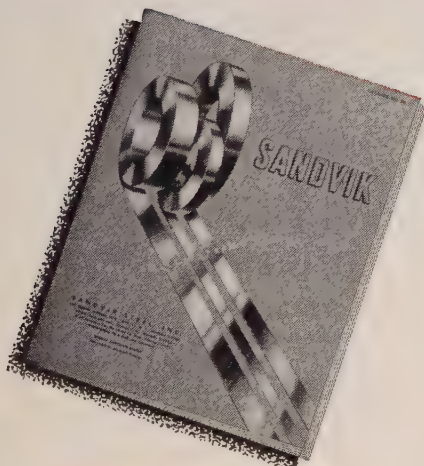
WILSON ST. at PENNA. R. R.

Salem - Ohio



**Where you'll find
an eager ear**

FOR YOUR SPRING STEEL PROBLEMS



FREE!

**SANDVIK CATALOG DESCRIBES
785 SPRING STEEL SIZES**

**Write, on your letterhead, for
your copy, today.**

HERE'S WHY...

In spite of shortages, your Sandvik representative is still solving spring steel problems every day.

He's using his specialized knowledge to suggest close-to-perfect substitutes for out-of-stock sizes. He's supplying steel to accurate tolerances that minimize rejects. And, he is still supplying the exact answers to specific spring steel requirements from Sandvik's stock of over 800 sizes.

For spring steel with uniform physical characteristics, fine surface finish, accurate gauge and long fatigue life, check with Sandvik.

Sandvik cold-rolled, high carbon strip steels are available:

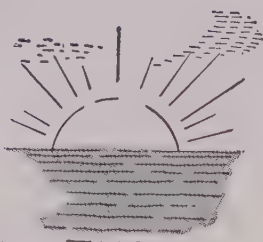
- Precision rolled in thicknesses from .001"
- In straight carbon and alloy grades
- In special analyses for specific applications
- Annealed, unannealed or hardened and tempered
- In a wide range of widths
- Unpolished or polished bright, yellow or blue
- With square, round or treated edges

Phone, write or wire your nearest Sandvik office for further information or technical help.

SANDVIK STEEL, INC., 111 EIGHTH AVENUE, NEW YORK 11, N. Y.
Watkins 9-7180

230 N. Michigan Ave., Chicago 1, Ill., FRanklin 2-5638
1736 Columbus Rd., Cleveland 13, Ohio, CHerry 1-2303
SANDVIK CANADIAN LTD., 426 McGill St., Mont., Can.

The
sun
comes
up ...

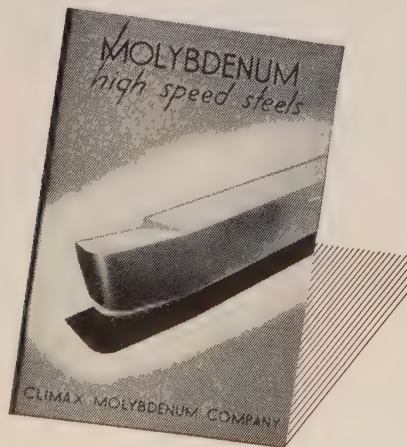


and
just as
inevitably
you will switch
to the use of
MOLYBDENUM
High Speed Steel

It is readily available from manufacturers and warehouses. Tools made from it give service as good as or even better than the tungsten type of steel—most of the high speed steel used by leading tool manufacturers is the Molybdenum type.

You can save money by changing, and above all, you will help to conserve tungsten for uses for which it is really needed.

The facts you need are in
this **FREE BOOKLET**



Climax Molybdenum Company
500 Fifth Avenue · New York City

Please send your **FREE BOOKLET**
"MOLYBDENUM HIGH SPEED STEELS"

Name

Position

Company

Address

S-10

HS-10

of an electric timer and solenoid shutter. Unit may be used with the company's Plastiphotor to make plates for offset duplicating.

One-Hand Operated Extinguisher

Redi-Grip pressurized portable fire extinguisher, available from Stop-Fire Inc., Brooklyn 1, N. Y., features one-hand operation. It is made in 1, 2½ and 4-quart sizes and has a combination of charges: Chlorobromomethane or carbon tetrachloride, individually or in combination and expellant may be air or carbon dioxide. A patented safety lock prevents accidental discharge.

Electric Etcher

Taylor-Hobson Javelin etcher, distributed by Engis Equipment Co., Chicago, Ill., handles up to 15 workpieces at one time. It etches hard or soft metals, flat or curved surfaces with identifying numbers, names, trademarks or designs.

Bench-Type Parts Cleaner

Brush-Flush, a bench-type parts cleaner with fountain brush action is available from Graymills Corp., Evanston, Ill. It features a hollow handle brush attached to pump with a tube to produce a steady flow of clear solvent at the end of the bristles. Oil grease and dirt are flushed away as they are loosened with the brush.

Interval Timers

Tork Clock Co. Inc., Mt. Vernon, N. Y., has revised its line of single-set-timers. They are available for permanent installation or for portable use with cord and plug. Portable plug-in models are rated 6 or 15 amp. Timing interval is set by turning indicator knob on plainly marked dial.

Drill Grinder

A drill grinder for two-lip twist drills from No. 70 to ¼-inch, straight or tapered shank, is offered by Dumore Co., Racine, Wis. With this tool the user can quickly obtain any included angle of drill point from 90 to 160 degrees and any clearance angle from 5 to 15 degrees.

Snap-Action Switches

Two standard model snap-action switches are offered by Cherry-Channer Corp., Highland Park, Ill. They

feature over-center coil spring construction that permits a wide range of actuating pressures by specifying spring element of proper characteristics for any job. Standard model 200 has a release force of 5.5 ounces and requires an operating force of 7.5 ounces; model 2001, release force 2.7 ounces requiring an operating force of 4 ounces.

Temperature Indicating Paint

Tempil Corp., New York 11, N. Y., offers Thermindex temperature indicating paint for research and development work. Paints are available in 16 basic shades which undergo color changes at predetermined temperatures. Many exhibit successive color transformation at several temperature levels.

Laminated Foil Cloth

Ray-Foil, a flexible, protective cloth offered by Safety First Supply Co., Pittsburgh 19, Pa., protects personnel and equipment from high radiant heat and other high temperatures. It can be used as a curtain or drape, a shield to be carried, a heat or glare baffle, or as a stand shield with a portable fire-resistant canvas wire shield.

Cleans, Dries Air Lines

Vi-Speed air drier, announced by Van Products Co., Erie, Pa., removes moisture, oil, dust, dirt, smoke and scale from compressed air and gases. It reduces humidity below condensation point and acts as a storage tank. It is self-cleaning, self-regulating and fully automatic.

Automatic Duplicating Machine

Duplicator D-270, announced by Rex-Rotary Distributing Corp., New York 1, N. Y., features a completely automatic premeasured inking system. An ink cartridge is inserted, a dial set for the degree of inking and the machine needs no further attention. All copies come out perfectly and uniformly printed. A bell rings when the ink cartridge is empty. A new one is easily inserted.

FOR MORE INFORMATION

on the new products and equipment in this section write to Readers' Service Dept., STEEL, Penton Bldg., Cleveland 13, O. Your request will receive prompt attention.

DETERMINED action is being taken by NPA control authorities to clear the order log-jams in steel, aluminum and copper. Failure of tonnage cancellations to come through in anticipated volume against preliminary allotments necessitates firm action to clear books of duplicate tonnage. Many consumers, large and small, still are unable to find takers for fourth quarter CMP tickets. In steel, cancellations have not come to the mills in anything like predicted tonnage. Through speeding up the machinery for cancelling out duplications, NPA hopes to cut back sufficient orders on mill books to make way for currently stranded tickets.

CARRYOVER—Shipment arrearages from third quarter intensifies the fourth quarter log-jam. Consequently, it was not surprising when NPA last week moved drastically to clear away carryovers. It ordered all unfilled third quarter orders not shipped by Oct. 7 must be charged by consumers against their fourth quarter allotments. The same cut-off date, seven days after expiration of a quarter, also is established for succeeding three month periods. Heretofore, authorized CMP orders accepted by the mills for delivery in a stated period might be filled at any subsequent time and still be charged only against the allotment of the particular period originally named. This change in practice will penalize some consumers whose third quarter shipments were delayed through no fault of their own, but rather through delays occasioned by imposition of government directives in mill schedules.

IMPACT—Extent to which duplicate tonnage will be cleared from mill books by this action is uncertain. No one knows definitely how large the duplications are. While carryovers from third quarter were substantial in the various steel products, the steel mills have no way of determining to what extent any customer's tonnage is a duplication. In this connection, it is significant that cancellations still are the responsibility of the consumers, not the mills. Generally, impact of the order will vary from

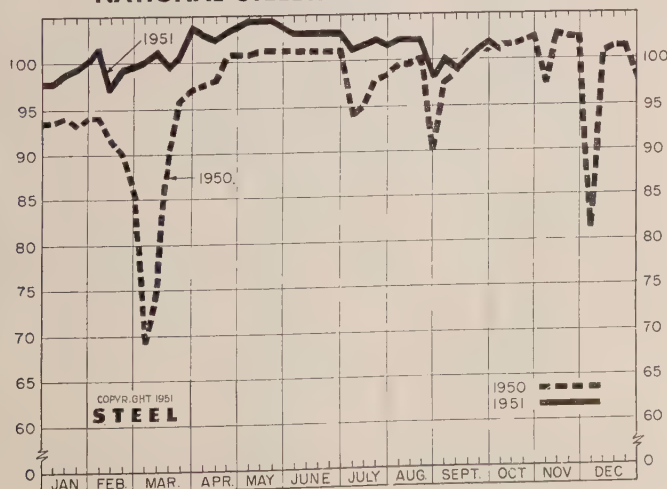
product to product, and from district to district. In some items, the mills may find themselves with open space in rolling schedules before fourth quarter ends, space that cannot be filled easily. In other products, however, bars for example, the tonnage of unplaced fourth quarter CMP tickets is so great any gaps appearing in mill schedules due to cancellations will be quickly filled.

BOOKINGS—Steelmakers are moving cautiously in booking forward business. This applies even to first quarter tonnage. Few mills are accepting anything beyond that period except in the case of "must" defense requirements. Some of the larger users, including carbuilders, tank fabricators and structural shops, still hold unplaced CMP tickets for fourth quarter, and it seems likely the mills will concentrate on clearing up this situation before becoming firmly committed on much forward tonnage. This is especially true pending government processing of first quarter applications.

PRODUCTION—Labor difficulties and equipment breakdowns are adversely affecting semifinished and finished steel production. Last week the national ingot rate declined ½ point to 101 per cent of capacity, largely reflecting a sharp slump in Youngstown operations attributable to labor trouble. At Gary some 6000 tons of steel were lost because of a wildcat strike. Ford's blooming mill broke down last week and the company found it necessary to ship steel to the East for rolling. A number of blast furnaces currently are idle for repairs.

PRICES—Steel and related product prices hold at government freeze levels. Except for a few specialties, no change has been effected in schedules since January. Last week Mystic Iron Works, the New England producer, with approval of OPS advanced its pig iron prices \$1.75 per ton. This increase is based on a government-approved formula for computing quarterly contract prices for that particular furnace. STEEL's weighted index on finished steel holds at 171.92.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Oct. 6	Change	Same Week 1950	Same Week 1949
Pittsburgh	98.5	- 1*	102	3.5
Chicago	106.5	+ 1.5*	102	6
Mid-Atlantic	100	0	99	7.5
Youngstown	94	-12	106	0
Wheeling	96.5	0	99.5	59
Cleveland	103	+ 6*	98.5	0
Buffalo	104	0	104	0
Birmingham	104	+ 2	100	4
New England	90	- 3	82	52
Cincinnati	100	- 3	99	52
St. Louis	88.5	+ 2	94	84.5
Detroit	103.5	0*	106	0
Western	103	+ 1	103	20
Estimated national rate	101	- 0.5	101.5	7.5

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Oct. 4 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)...	171.92	171.92	171.92	157.28	112.04
Index in cents per lb.	4.657	4.657	4.657	4.261	3.035

ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	\$106.32	\$106.32	\$106.32	\$94.50	\$64.45
No. 2 Fdry, Pig Iron, GT...	52.54	52.54	52.54	48.79	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	47.72	27.50
Malleable Pig Iron, GT	53.27	53.27	53.27	49.20	28.79
Steelmaking scrap, GT ...	44.00	44.00	44.00	41.00	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown, Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 4 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	3.93	2.86
Bars, C.F., Pittsburgh	4.65	4.65	4.65	4.10-15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia ...	3.918	3.918	3.918	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh ...	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh ...	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh ...	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.50	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh ...	4.65-5.35	4.65-5.35	4.65-5.35	4.15-50	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-95	3.15
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.50-4.75	3.05
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.30-5.60	3.75
Tin plate, box, Pittsburgh ...	\$8.70	\$8.70	\$8.70	\$7.50	\$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	\$66.00	\$66.00	\$66.00	\$63.00	\$47.00
Wire rods, $\frac{7}{8}$ "- $\frac{1}{2}$ ", Pitts. ...	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	\$53.00	\$53.00	\$53.00	\$47-\$50	\$29.00
Basic Valley	52.00	52.00	52.00	46-49	28.00
Basic, del. Phila.	56.61	56.61	56.61	50.39	29.93
No. 2 Fdry, Pitts.	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50-49.50	28.50
No. 2 Fdry, Valley	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Del. Phila.	57.11	57.11	57.11	50.89	30.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	45.88	24.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	52.58	28.94
Malleable Valley	52.50	52.50	52.50	49.50	28.50
Malleable, Chicago	52.50	52.50	52.50	46.50-49.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	62.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts. ...	\$45.00	\$45.00	\$45.00	\$44.00	\$20.00
No. 1 Heavy Melt, E. Pa. ...	43.50	43.50	43.50	39.00	18.75
No. 1 Heavy Melt, Chicago ...	43.50	43.50	43.50	40.00	18.75
No. 1 Heavy Melt, Valley ...	45.00	45.00	45.00	43.75	20.00
No. 1 Heavy Melt, Cleve. ...	44.00	44.00	44.00	43.00	19.50
No. 1 Heavy Melt, Buffalo ...	44.00	44.00	44.00	41.50	19.25
Rails, Rerolling, Chicago ...	52.50	52.50	52.50	61.00	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	50.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connsvl. ...	\$14.75	\$14.75	\$14.75	\$14.25	\$8.75
Beehive, Fdry., Connsvl. ...	17.50	17.50	17.50	16.50	9.50
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	14.375
Zinc, E. St. Louis.	19.50	17.50	17.50	17.50	8.25
Lead, St. Louis	18.80	16.80	16.80	15.80	8.10
Tin, New York	103.00	103.00	103.00	106.00	52.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ...	42.00	42.00	42.00	32.00	14.50
Nickel, refinery, duty paid.	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malle- able	Besse- mer
Bethlehem, Pa. B2	\$54.00	\$54.50	\$55.00	\$55.50
Brooklyn, N.Y., del. ....	...	59.18	59.68	...
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	...	...
Birmingham R2	48.38	48.88	...	...
Birmingham S9	48.38	48.88	...	...
Woodward, Ala. W15	48.38	48.88	...	...
Cincinnati, del. ....	...	55.49	...	...
Buffalo District				
Buffalo R2	52.00	52.50	53.00	...
Buffalo H1	52.00	52.50	53.00	...
Tonawanda, N.Y. W12	52.00	52.50	53.00	...
No. Tonawanda, N.Y. T9 .....	...	52.50	53.00	...
Boston, del.	62.11	62.61	63.11	...
Rochester, N.Y., del.	54.88†	55.38†	55.88†	...
Syracuse, N.Y., del.	55.91†	56.41†	56.91†	...
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	...	52.50	...
Indiana Harbor, Ind. I-2	52.00	...	52.50	...
So. Chicago, Ill. W14	52.00	52.50	52.50	...
So. Chicago, Ill. Y1	52.00	52.50	52.50	...
So. Chicago, Ill. U5	52.00	...	52.50	53.00
Millwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del. ....	...	58.47	58.47	...
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	...
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	...	...	53.00
Duluth I-3 .....	...	...	52.50	...
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1 .....	...	57.00	57.50	...
Fontana, Calif. K1	58.00	58.50	...	...
Geneva, Utah G1	52.00	52.50	...	...
Seattle, Tacoma, Wash., del. ....	...	60.68	...	...
Portland, Ore., del. ....	...	60.68	...	...
Los Angeles, San Francisco, del.	60.16	60.68	...	...
Granite City, Ill. G4	53.90	54.40	54.90	...
St. Louis, del. (inc. tax)	54.66	55.16	55.68	...
Ironton, Utah C11	52.00	52.50	...	...
Lone Star, Tex. L6	48.00	*48.50	48.50	...
Minnequa, Colo. C10	54.00	55.00	55.00	...
Pittsburgh District				
Neville Island, Pa. P6 .....	...	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, ...	...	53.80	53.80	54.30
Aliquippa, del. ....	...	53.54	53.54	54.04
McKees Rocks, del. ....	...	...	...	...
Lawrenceville, Homestead, ...	...	54.07	54.07	54.57
McKeesport, Monaca, del. ....	...	54.57	54.57	55.07
Verona, del. ....	...	54.82	54.82	55.32
Brackenridge, del. ....	...	...	52.50	53.00
Bessemer, Pa. U5	52.00	...	...	...
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	...	...	...
McKeesport, Pa. N3	52.00	...	...	53.00
Monessen, Pa. P7	54.00	...	...	...
Sharpsville, Pa. S6 .....	...	...	52.50	53.00
Steeltown, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	...	...
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	...
Youngstown Y1	52.00	52.50	52.50	...
Youngstown U5	52.00	...	...	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade. † Preliminary.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add \$2 per ton and each additional 0.25%, add \$1 per ton.

BLAST FURNACE SILVERLY IRON, Gross Ton

(Base 6.0016.50% silicon; add \$1.50 for each 0.5% Si)	
Jackson, O. G2, J1	\$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERLY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1 for each 0.5% Mn over 1%; \$1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	\$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12 $\frac{1}{2}$ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	\$66.00
-----------------------	---------

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	\$57.00
Steeltown, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Oct. 4, 1951; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Fontana, Calif. K1	\$79.00
Munhall, Pa. U5	\$52.00

INGOTS, Alloy (NT)

Detroit R7	\$54.00
Fontana, Calif. K1	80.00
Houston, Tex. S5	62.00
Midland, Pa. C18	54.00
Munhall, Pa. U5	54.00

BILLETS, BLOOMS & SLABS

Carbon, Re-rolling (NT)

Bessemer, Pa. U5	\$56.00
Clairefont, Pa. U5	56.00
Ensley, Ala. T2	56.00
Fairfield, Ala. T2	56.00
Fontana, Calif. K1	75.00
Gary, Ind. U5	56.00
Johnstown, Pa. B2	56.00
Lackawanna, N.Y. B2	56.00
Munhall, Pa. U5	56.00
So. Chicago, Ill. U5	56.00
So. Duquesne, Pa. U5	56.00

Carbon, Forging (NT)

Bessemer, Pa. U5	\$66.00
Buffalo R2	66.00
Canton, O. R2	66.00
Clairefont, Pa. U5	66.00
Cleveland R2	66.00
Conshohocken, Pa. A3	73.00
Detroit R7	69.00
Ensley, Ala. T2	66.00
Fairfield, Ala. T2	66.00
Fontana, Calif. K1	85.00
Gary, Ind. U5	66.00
Geneva, Utah G1	66.00
Houston, Tex. S5	66.00
Johnstown, Pa. B2	74.00
Lackawanna, N.Y. B2	68.00
Los Angeles B3	85.00
Munhall, Pa. U5	68.00
Seattle B3	85.00
So. Chicago R2, U5, W14	66.00
So. Duquesne, Pa. U5	66.00
So. San Francisco B3	85.00

Alloy, Forging (NT)

Bethlehem, Pa. B2	\$70.00
Buffalo R2	70.00
Canton, O. R2	70.00
Canton, O. (29) T7	66.00
Conshohocken, Pa. A3	77.00
Detroit R7	73.00
Fontana, Calif. K1	89.00
Gary, Ind. U5	70.00
Houston, Tex. S5	78.00
Ind. Harbor, Ind. Y1	70.00
Johnstown, Pa. B2	70.00
Lackawanna, N.Y. B2	70.00
Los Angeles B3	90.00
Massillon, O. R2	70.00
Midland, Pa. C18	70.00
Munhall, Pa. U5	70.00
So. Chicago R2, U5, W14	70.00
So. Duquesne, Pa. U5	70.00
Struthers, O. Y1	70.00
Warren, O. C17	70.00

ROUNDS, SEAMLESS TUBE (NT)

Canton, O. R2	\$82.00
Cleveland R2	82.00
Fontana, Calif. K1	103.00
Gary, Ind. U5	82.00
Massillon, O. R2	82.00
So. Chicago, Ill. R2	82.00
So. Duquesne, Pa. U5	82.00

SHEET BARS (NT)

Fontana, Calif. K1	\$89.00
--------------------	---------

SKELP

Altiappa, Pa. J5	\$3.45
Munhall, Pa. U5	3.35
Warren, O. R2	3.35
Youngstown, R2, U5	3.35

WIRE RODS

Alton, Ill. L1	4.40
Alabama City, Ala. R2	4.10
Buffalo W12	4.10
Cleveland A7	4.10
Donora, Pa. A7	4.10
Fairfield, Ala. T2	4.10
Fontana, Calif. K1	4.90
Houston, Tex. S5	4.50
Johnstown, Pa. B2	4.10
Joliet, Ill. A7	4.10
Los Angeles B3	4.90
Minneapolis, Colo. C10	4.35
Monessen, Pa. P7	4.30
No. Tonawanda, N.Y. B11	4.10
Pittsburgh, Calif. C11	4.75
Portsmouth, O. P12	4.30
Roebing, N.J. R5	4.20
So. Chicago, Ill. R2	4.10
SparrowsPoint, Md. B2	4.20
Sterling, Ill. (1) N15	4.10
Struthers, O. Y1	4.10
Torrance, Calif. C11	4.90
Worcester, Mass. A7	4.40

SHEET STEEL PILING

Ind. Harbor, Ind. I-2	4.45
Lackawanna, N.Y. B2	4.45
Munhall, Pa. U5	4.45
So. Chicago, Ill. U5	4.45

STRUCTURALS

Carbon Steel Stand. Shapes

Alabama City, Ala. R2	3.60
Altiappa, Pa. J5	3.65
Bessemer, Ala. T2	3.65
Bethlehem, Pa. B2	3.70
Clairefont, Pa. U5	3.65
Fairfield, Ala. T2	3.65
Fontana, Calif. K1	4.25
Gary, Ind. U5	3.65
Geneva, Utah G1	3.65
Houston, Tex. S5	4.05
Ind. Harbor, Ind. I-2	3.65
Johnstown, Pa. B2	3.70
Kansas City, Mo. S5	4.25
Lackawanna, N.Y. B2	3.70
Los Angeles B3	4.25
Minneapolis, Colo. C10	4.10
Munhall, Pa. U5	3.65
Niles, Calif. (22) P1	4.85
Phoenixville, Pa. P4	6.25
Portland, Ore. O4	4.50
Seattle B3	4.30
So. Chicago, Ill. U5, W14	3.65
So. San Francisco B3	4.20
Torrance, Calif. C11	4.25
Weirton, W. Va. W6	3.90

Alloy Stand. Shapes

Clairefont, Pa. U5	4.35
Fontana, Calif. K1	5.55
Munhall, Pa. U5	4.35
So. Chicago, Ill. U5	4.35

H.S., L.A. Stand. Shapes

Altiappa, Pa. J5	5.50
Bessemer, Ala. T2	5.50
Bethlehem, Pa. (14) B2	5.50
Clairefont, Pa. U5	5.50
Fairfield, Ala. T2	5.50
Fontana, Calif. K1	6.10
Gary, Ind. U5	5.50
Geneva, Utah G1	5.50
Ind. Harbor, Ind. I-2	5.50
Ind. Harbor, Ind. Y1	6.00
Johnstown, Pa. B2	5.50
Lackawanna, N.Y. (14) B2	5.50
Los Angeles B3	6.05
Munhall, Pa. U5	5.50
Seattle B3	6.10
So. Chicago, Ill. U5	5.50
So. San Francisco B3	6.00
Struthers, O. Y1	6.00

Wide Flange

Bethlehem, Pa. B2	3.70
Clairefont, Pa. U5	3.65
Fontana, Calif. K1	4.65
Lackawanna, N.Y. B2	3.70
Munhall, Pa. U5	3.65
So. Chicago, Ill. U5	3.65

H.S., L.A. Wide Flange

Bethlehem, Pa. B2	5.50
Lackawanna, N.Y. B2	5.50
Munhall, Pa. U5	5.45
So. Chicago, Ill. U5	5.45

BEARING PILES

Munhall, Pa. U5	3.65
So. Chicago, Ill. U5	3.65

PLATES, High-Strength Low-Alloy

Altiappa, Pa. J5	5.65
Bessemer, Ala. T2	5.65
Clairefont, Pa. U5	5.65
Cleveland J5, R2	5.65
Conshohocken, Pa. A3	5.90
Fairfield, Ala. T2	5.65
Fontana, Calif. (30) K1	6.25
Gary, Ind. U5	5.65
Geneva, Utah G1	5.65
Ind. Harbor, Ind. I-2	5.65
Ind. Harbor, Ind. Y1	6.15
Johnstown, Pa. B2	5.65
Munhall, Pa. U5	5.65
Pittsburgh J5	5.65
Seattle B3	6.55
Sharon, Pa. S3	5.70
So. Chicago, Ill. U5	5.65
SparrowsPoint, Md. B2	5.65
Warren, O. R2	5.65
Youngstown Y1	6.15

PLATES, Open-Hearth Alloy

Claymont, Del. C22	4.85
Coatesville, Pa. L7	5.25
Conshohocken, Pa. A3	5.05
Fontana, Calif. K1	5.70
Gary, Ind. U5	4.75
Johnstown, Pa. B2	4.75
Munhall, Pa. U5	4.75
Sharon, Pa. S3	5.20
So. Chicago, Ill. U5	4.75
SparrowsPoint, Md. B2	4.75

FLOOR PLATES

Cleveland J5	4.75
Conshohocken, Pa. A3	4.75
Harrisburg, Pa. C5	5.95
Ind. Harbor, Ind. I-2	4.75
Munhall, Pa. U5	4.75
So. Chicago, Ill. U5	4.75

PLATES, Ingot Iron

Ashland, Cal. (15) A10	3.95
Ashland, Cal. (15) A10	4.45
Cleveland, Cal. R2	4.30
Warren, O. C1	4.30

PLATES, Carbon Steel

Alabama City, Ala. R2	3.70
Altiappa, Pa. J5	3.70
Ashland, Ky. (15) A10	3.70
Bessemer, Ala. T2	3.70
Clairefont, Pa. U5	3.70
Claymont, Del. C22	4.15
Cleveland J5, R2	3.70
Coatesville, Pa. L7	4.15
Conshohocken, Pa. A3	4.15
Fairfield, Ala. T2	3.70
Fontana, Calif. (30) K1	4.30
Gary, Ind. U5	3.70
Granite City, Ill. G4	4.40
Geneva, Utah, G1	3.70
Harrisburg, Pa. C5	6.75
Houston, Tex. S5	4.10
Ind. Harbor, Ind. I-2, Y1	3.70
Johnstown, Pa. B2	3.70
Lackawanna, N.Y. B2	3.70
Minneapolis, Colo. C10	4.50
Munhall, Pa. U5	3.70
Pittsburgh J5	3.70
Seattle B3	4.60
Sharon, Pa. S3	3.95
So. Chicago, Ill. U5, W14	3.70
SparrowsPoint, Md. B2	3.70
Staubenville, O. W10	3.70
Warren, O. R2	3.70
Weirton, W. Va. W6	4.00
Youngstown R2, U5, Y1	3.70

PLATES, Carbon A.R.

Fontana, Calif. K1	5.45
Geneva, Utah G1	4.85

PLATES Wrought Iron

Economy, Pa. B14	8.60
------------------	------

BARS, Hot-Rolled Carbon

Alabama City, Ala. R2	3.70
Altiappa, Pa. J5	3.70
Alton, Ill. L1	4.15
Atlanta, Ga. A11	4.25
Bessemer, Ala. T2	3.70
Buffalo R2	3.70
Canton, O. R2	3.70
Clairefont, Pa. U5	3.70
Cleveland R2	3.70
Detroit R7	3.85
Emeryville, Calif. J7	4.45
Fairfield, Ala. T2	3.70
Fontana, Calif. K1	4.40
Gary, Ind. U5	3.70
Houston, Tex. S5	4.10
Ind. Harbor, Ind. I-2, Y1	3.70
Johnstown, Pa. B2	3.70
Kansas City, Mo. S5	4.30
Lackawanna, N.Y. B2	3.70
Los Angeles B3	4.40
Milton, Pa. B6	4.20
Minneapolis, Colo. C10	4.15
Niles, Calif. P1	5.05
N. Tonawanda, N.Y. B11	3.70
Pittsburgh, Calif. C11	4.40
Pittsburgh J5	3.70
Portland, Ore. O4	4.65
Seattle B3, N14	4.45
So. Chicago R2, U5, W14	3.70
So. Duquesne, Pa. U5	3.70
So. San Fran., Cal. B3	4.45
Struthers, O. Y1	3.70
Torrance, Calif. C11	4.40
Weirton, W. Va. W6	3.85
Youngstown R2, U5	3.70

BAR SIZE ANGLES; S. SHAPES

Altiappa, Pa. J5	3.70
Atlanta A11	4.25
Johnstown, Pa. B2	3.70
Lackawanna, N.Y. B2	3.70
Niles, Calif. P1	5.05
Portland, Ore. O4	4.65
San Francisco S7	4.85

BAR SIZE ANGLES; H.R. CARBON

Bethlehem, Pa. B2	3.90
-------------------	------

BARS, Hot-Rolled Alloy

Bethlehem, Pa. B2	4.30
Buffalo R2	4.30
Canton, O. R2	4.30
Canton, O. (29) T7	3.95
Clairefont, Pa. U5	4.30
Detroit R7	4.45
Ecorse, Mich. G5	4.65
Fontana, Calif. K1	5.35
Gary, Ind. U5	4.30
Houston, Tex. S5	4.70
Ind. Harbor, Ind. I-2, Y1	4.30
Johnstown, Pa. B2	4.30
Kansas City, Mo. S5	4.90
Lackawanna, N.Y. B2	4.30
Los Angeles B3	5.35
Massillon, O. R2	4.30
Midland, Pa. C18	4.30
So. Chicago R2, U5, W14	4.30
So. Duquesne, Pa. U5	4.30
Struthers, O. Y1	4.30
Warren, O. C17	4.30
Youngstown U5	4.30

BAR SHAPES, Hot-Rolled Alloy

Clairefont, Pa. U5	4.55
Gary, Ind. U5	4.55
Youngstown U5	4.55

BARS & SMALL SHAPES, H.R.,

High-Strength Low-Alloy

Altiappa, Pa. J5	5.55
Bessemer, Ala. T2	5.55
Bethlehem, Pa. B2	5.55
Clairefont, Pa. U5	5.55
Cleveland R2	5.55
Fairfield, Ala. T2	5.55
Fontana, Calif. K1	6.60
Gary, Ind. U5	5.55
Ind. Harbor, Ind. I-2	5.55
Indiana Harbor, Ind. Y1	6.05
Johnstown, Pa. B2	5.55
Lackawanna, N.Y. B2	5.55
Los Angeles B3	6.25
Pittsburgh J5	5.55
Seattle B3	6.30
So. Duquesne, Pa. U5	5.55
So. San Francisco B3	6.30
Struthers, O. Y1	6.05
Youngstown U5	5.55

BARS, Cold-Finished Carbon

Ambridge, Pa. W18	4.55
Beaver Falls, Pa. M12, R2	4.55
Buffalo B5	4.60
Camden, N.J. P13	5.00
Carnegie, Pa. C12	4.55
Chicago W18	4.55
Cleveland A7, C20	4.55
Detroit P17	4.70
Donora, Pa. A7	4.55
Elyria, O. W8	4.55
Franklin Park, Ill. N5	4.55
Gary, Ind. R2	4.55
Green Bay, Wis. F7	4.55
Hammond, Ind. L2, M13	4.55
Hartford, Conn. R2	5.10
Harvey, Ill. B5	4.55
Los Angeles R2	6.00
Mansfield, Mass. B5	5.10
Massillon, O. R2, R8	4.55
Monaca, Pa. S17	4.55
Newark, N.J. W18	5.00
Plymouth, Mich. P5	4.80
Pittsburgh J5	4.55
Putnam, Conn. W18	5.10
Readville, Mass. C14	4.55
St. Louis, Mo. M5	4.95
So. Chicago, Ill. W14	4.55
Spring City, Pa. (5) K3	5.00
Struthers, O. Y1	4.55
Waukegan, Ill. A7	4.55
Youngstown F3, Y1	4.55

BARS, Reinforcing

(Fabricated to Consumers)

Huntington, W. Va. W7	5.50
Johnstown, Pa. B2	4.75
Los Angeles B3	5.45
Marion, O. P11	5.00
Seattle B3, N14	5.55
So. San Francisco B3	5.45
SparrowsPt. 1/4-1" B2	4.75
Williamsport, Pa. S19	5.10

SHEETS, Hot-Rolled Steel

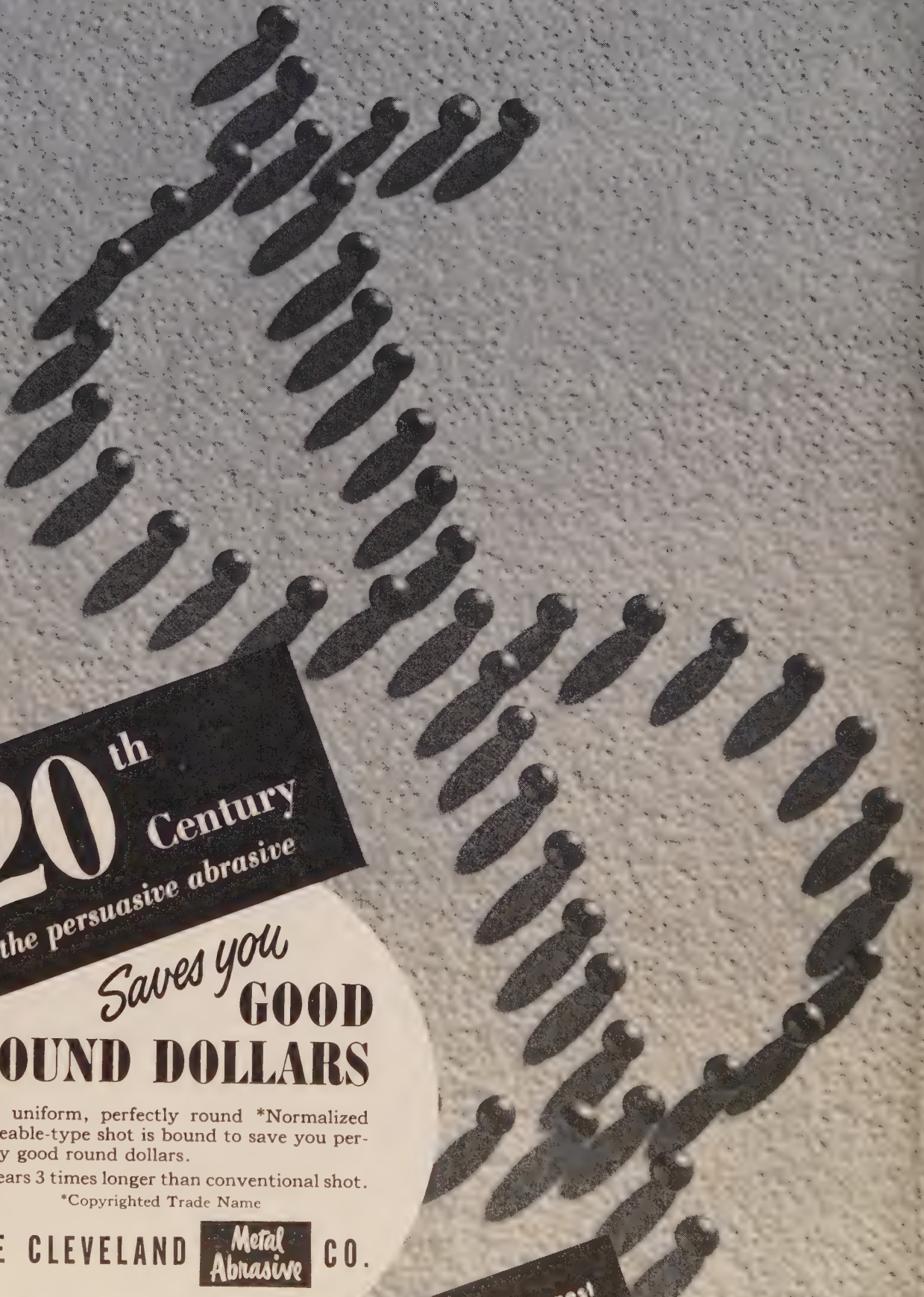
(18 gage and heavier)

Monaca, Pa. S17	.....4.55
Newark,N.J. W18	.....5.00
Plymouth,Mich. P5	.....4.80
Pittsburgh J5	.....4.55
Putnam,Conn. W18	.....5.10
Readville, Mass. C14	.....5.10
St. Louis,Mo. M5	.....4.95
So.Chicago,Ill. W14	.....4.55
SpringCity,Pa. (5) K3	.....5.00
Struthers,O. Y1	.....4.65
Waukegan,Ill. A7	.....4.55
Youngstown F3, Y1	.....4.55

SHEETS, Cold-Rolled Steel (Commercial Quality)				MANUFACTURING TERNES (Special Coated)				TIN PLATE, American 1.25 1.50 Coke (Base Box) lb lb				STRIP, Hot-Rolled Carbon Ala. City, Ala. (27) R2 ... 3.50				New Britn, Conn. (10) S15 10.75			
Butler, Pa. A10	4.35			Fairfield, Ala. T2	\$7.60			Aluquippa J5	\$8.45	\$8.70		Alton, Ill. L1	3.95			Pawtucket, R.I. (11) N8	10.75		
Cleveland J5, R2	4.35			Gary, Ind. U5	7.50			Fairfield, Ala. T2	8.55	8.80		Ashland, Ky. (8) A10	3.50			Pawtucket, R.I. (12) N8	11.05		
Ecorse, Mich. G5	4.55			Irvin, Pa. U5	7.50			Gary, Ind. U5	8.45	8.70		Atlanta A11	4.05			Sharon, Pa. S3	10.60		
Fairfield, Ala. T2	4.35			Sparrows Point, Md. B2	7.60			Ind. Har. I-2, Y1	8.45	8.70		Bessemer, Ala. T2	3.50			Worcester, Mass. A7	10.30		
Follansbee, W. Va. F4	5.35			Yorkville, O. W10	7.50			Irvin, Pa. U5	8.45	8.70		Bridgeprt, Conn. (10) S15	4.00			Youngstown C8	10.60		
Fontana, Calif. K1	5.30			SHEETS, LT. Coated Ternes, 6 lb				Pitts., Cal. C11	9.20	9.45		Buffalo (27) R2	3.50			STRIP, Cold-Rolled Carbon			
Gary, Ind. U5	4.35			Yorkville, O. W10	\$8.40			Sp. Pt., Md. B2	8.55	8.80		Butler, Pa. A10	3.50			Anderson, Ind. (40) G6	5.50		
Granite City, Ill. G4	5.05			SHEETS, Mfg. Ternes, 8 lb				Warren, O. R2	8.45	8.70		Carnegie, Pa. S18	4.00			Berea, O. C7	6.60		
Ind. Harbor, Ind. I-2, Y1	4.35			(Commercial Quality)				Weirton, W. Va. W6	8.45	8.70		Conshohocken, Pa. A3	3.90			Bridgeprt, Conn. (10) S15	5.35		
Irvin, Pa. U5	4.35			Gary, Ind. U5	\$9.50			Yorkville, O. W10	8.45	8.70		Detroit M1	4.40			Butler, Pa. A10	4.65		
Lackawanna, N.Y. B2	4.35			Yorkville, O. W10	9.50			BLACK PLATE				Ecorse, Mich. G5	3.80			Cleveland A7, J5	4.65		
Middletown, O. A10	4.35			(Base Box)				Aluquippa, Pa. J5	\$6.25			Fontana, Calif. K1	4.75			Dearborn, Mich. D3	5.60		
Pittsburg, Calif. C11	5.30			SHEETS, Long Ternes Steel				Fairfield, Ala. T2	6.35			Gary, Ind. U5	3.50			Detroit D2	5.60		
Pittsburgh J5	4.35			(Commercial Quality)				Fairfield, Ala. T2	6.35			Houston, Tex. S5	4.90			Detroit M1	5.45		
Sparrows Point, Md. B2	4.35			Beech Bottom, W. Va. W10	5.20			Gary, Ind. U5	6.25			Ind. Harbor, Ind. I-2, Y1	3.50			Dover, O. (40) G6	5.50		
Staubenville, O. W10	4.35			Gary, Ind. U5	5.20			Granite City, Ill. G4	6.45			Johnstown, Pa. (25) B2	3.50			Ecorse, Mich. G5	4.85		
Warren, O. R2	4.35			Mansfield, O. E6	6.05			Ind. Harbor, Ind. I-2, Y1	6.25			Kansas City, Mo. (9) S5	4.10			Follansbee, W. Va. F4	5.35		
Weirton, W. Va. W6	4.35			Middletown, O. A10	5.20			Irvin, Pa. U5	6.25			Lackawanna, N.Y. (32) B2	3.50			Fontana, Calif. K1	6.30		
Youngstown Y1	4.35			Niles, O. N12	6.00			Niles, O. R2	6.25			Los Angeles B3	4.25			Franklin Park, Ill. (40) T6	4.90		
SHEETS, Galv'd No. 10 Steel				Weirton, W. Va. W6	5.20			Pittsburg, Calif. C11	7.00			Milton, Pa. B6	4.00			Ind. Harbor, Ind. I-2	4.90		
Alabama City, Ala. R2	4.80			SHEETS, Long Ternes, Ingot Iron				Sparrows Point, Md. B2	6.35			Minnequa, Colo. C10	4.55			Lackawanna, N.Y. B2	4.65		
Ashland, Ky. (8) A10	4.80			Middletown, O. A10	5.60			Warren, O. R2	6.25			New Britain (10) S15	4.00			Los Angeles C1	6.40		
Canton, O. R2	4.80			SHEETS, Enameling Iron				Weirton, W. Va. W6	6.25			No. Tonawanda, N.Y. B11	3.50			Mattapan, Mass. T6	5.50		
Dover, O. R1	5.50			Ashland, Ky. (8) A10	4.65			Yorkville, O. W10	6.25			Pittsburg, Calif. C11	4.25			Middletown, O. A10	4.65		
Fairfield, Ala. T2	4.80			Cleveland R2	4.65			HOLLOWARE ENAMELING				Riverdale, Ill. A1	3.50			New Britain (10) S15	5.35		
Gary, Ind. U5	4.80			Gary, Ind. U5	4.65			Black Plate (29 gage)				San Francisco S7	4.85			New Castle, Pa. B4	5.35		
Granite City, Ill. G4	5.50			Granite City, Ill. G4	5.35			Follansbee, W. Va. F4	5.85			Seattle B3, N14	4.50			New Castle (40) E5	5.25		
Ind. Harbor, Ind. I-2	4.80			Ind. Harbor, Ind. I-2	4.65			Gary, Ind. U5	5.85			Sharon, Pa. S3	4.00			New Haven, Conn. D2	5.85		
Irvin, Pa. U5	4.80			Irvin, Pa. U5	4.65			Granite City, Ill. G4	6.05			So. Chicago, Ill. W14	3.50			New Haven, Conn. A7	5.15		
Kokomo, Ind. (13) C16	5.20			Middletown, O. A10	4.65			Ind. Harbor, Ind. Y1	5.30			So. San Francisco B3	4.25			Pawtucket, R.I. R3	6.00		
Martins Ferry, O. W10	4.80			Youngstown Y1	4.65			Irvin, Pa. U5	5.85			Sparrows Point, Md. B2	3.50			Pawtucket, R.I. (21) N8	5.85		
Niles, O. N12	6.00			SHEETS, Culvert				Yorkville, O. W10	6.15			Torrance, Calif. C11	4.25			Riverdale, Ill. (40) A1	4.90		
Pittsburg, Calif. C11	5.55			No. 16				STRIP, Hot-Rolled Alloy				Warren, O. R2	3.50			Rome, N.Y. R6	5.10		
Sparrows Point, Md. B2	4.80			Cu				Bridgeprt, Conn. (10) S15	5.45			Weirton, W. Va. W6	3.60			Sharon, Pa. S3	5.35		
Staubenville, O. W10	4.80			Alloy				Carnegie, Pa. S18	5.85			West Leecheburg, Pa. A4	3.75			Sparrows Point, Md. B2	4.65		
Torrance, Calif. C11	5.55			Ashland, Ky. A10	5.60			Fontana, Calif. K1	6.70			Youngstown U5, Y1	3.50			Trenton, N.J. R5	6.00		
Weirton, W. Va. W6	4.80			Canton, O. R2	5.65	6.10		Gary, Ind. U5	5.50			STRIP, Cold-Rolled Alloy Steel				Wallingford, Conn. W2	5.85		
SHEETS, Galvanized No. 10,				Fairfield, Ala. T2	5.60	5.85		Houston, Tex. S5	5.90			Bridgeprt, Conn. (10) S15	10.75			Warren, O. R2	4.65		
High-Strength Low-Alloy				Gary U5	5.60	5.85		Kansas City, Mo. S5	6.10			Carnegie, Pa. S18	10.60			Weirton, W. Va. W6	4.65		
Irvin, Pa. U5	7.20			Indiana Harbor I-2	5.60	5.85		Midland, Pa. C18	5.85			Cleveland A7	10.00			Youngstown C8 (40)	5.25		
Sparrows Point (39) B2	6.75			Kokomo, Ind. C16	6.25	5.85		New Britn, Conn. (10) S15	5.45			Dover, O. G6	10.50			Youngstown Y1	4.65		
SHEETS, Galvannealed Steel				Martins Fy, O. W10	5.60	5.85		Sharon, Pa. S3	5.85			Fontana, Calif. K1	11.65			STRIP, Electro Galvanized			
Canton, O. R2	5.35			Pittsburg, Cal. C11	6.35	5.85		Youngstown U5	5.50			Harrison, N.J. C18	10.60			Dover, O. G6	5.50		
Irvin, Pa. U5	5.35			Sparrows Pt. B2	5.60	5.85		STRIP, Hot-Rolled				New York W3			Warren, O. T5	5.25			
Kokomo, Ind. (13) C16	5.75			Torrance, Cal. C11	6.35	5.85		High-strength Low-Alloy				Pawtucket, R.I. N8:			Weirton, W. Va. W6	4.65			
Niles, O. N12	6.55			SHEETS, Culvert, No. 16				Bessemer, Ala. T2	5.30			Cleve. or Pitts. Base			Youngstown C8	5.25			
SHEETS, ZINCGRIP Steel No. 10				Pure Iron				Conshohocken, Pa. A3	5.55			Worcester, Mass., Base	5.85	6.80	7.40	9.35	11.65		
Butler, Pa. A10	5.05			Ashland, Ky. A10	5.85			Ecorse, Mich. G5	5.95			Sharon, Pa. S3	5.35	6.80	7.40	9.35	11.65		
Middletown, O. A10	5.05			Fairfield, Ala. T2	5.85			Fairfield, Ala. T2	5.30			Trenton, N.J. R5		7.10	7.70	9.65	11.95		
SHEETS, Electro Galvanized				SHEETS, Hot-Rolled Ingot Iron				Fontana, Calif. K1	6.20			Wallingford, Conn. W2	5.85	6.75	7.35	9.30	11.60		
Cleveland R2 (28)	5.65			18 Gage and Heavier				Gary, Ind. U5	5.30			Weirton, W. Va. W6	5.35	6.80	7.40	9.35	11.65		
Niles, O. R2 (28)	5.65			Ashland, Ky. (8) A10	3.85			Ind. Harb., Ind. I-2	5.30			Worcester, Mass. A7	4.95	6.75	7.70	9.65	11.95		
Weirton, W. Va. W6	5.50			Cleveland R2	4.20			Indiana Harbor, Ind. Y1	5.80			Worcester, Mass. T6	5.50	6.75	7.70	9.65	11.95		
SHEETS, Zinc Alloy				Ind. Harbor, Ind. I-2	3.85			Lackawanna, N.Y. B2	4.95			Youngstown C8		6.80	7.40	9.35	11.65		
Ind. Harbor, Ind. I-2	5.70			Warren, O. R2	4.20			Los Angeles (25) B3	6.05			Spring Steel (Tempered)			10.30	12.50	15.35		
SHEETS, Drum Body				SHEETS, Cold-Rolled Ingot Iron				Seattle B3	6.30			Harrison, N.J. R5			10.30	12.50	15.35		
Pittsburg, Calif. C11	4.30			Cleveland R2	4.95			Sharon, Pa. S3	5.40			New York W3			10.30	12.50	15.35		
Torrance, Calif. C11	4.30			Middletown, O. A10	4.85			So. San Francisco (25) B3	6.05			Key to Producers				C10 Colorado Fuel & Iron	G1 Geneva Steel Co.		
SHEETS, Well Casing				Warren, O. R2	4.95			Sparrows Point, Md. B2	4.95			A1 Acme Steel Co.	C11 Columbia Steel Co.	C12 Columbia Steel & Shaft	G2 Globe Iron Co.				
Fontana, Calif. K1	5.10			SHEETS, Galvanized Ingot Iron				Warren, O. R2	5.30			A3 Alan Wood Steel Co.	C13 Columbia Tool Steel Co.	C14 Compressed Steel Shaft	G3 Globe Steel Tubes Co.				
Torrance, Calif. C11	5.10			No. 10 flat				Weirton, W. Va. W6	5.75			A7 American Steel & Wire	C16 Continental Steel Corp.	C17 Copperweld Steel Co.	G4 Granite City Steel Co.				
BLUED Stock, 29 ga.				Ashland, Ky. (8) A10	5.05			Youngstown Y1	5.80			A8 Anchor Drawn Steel Co.	C17 Copperweld Steel Co.	C18 Crucible Steel Co.	G5 Great Lakes Steel Corp.				
Yorkville, O. W10	6.80			Canton, O. R2	5.55			Youngstown U5	5.30			A9 Angell Nail & Chaplet	C19 Cumberland Steel Co.	C20 Cuyahoga Steel & Wire	G6 Greer Steel Co.				
Follansbee, W. Va. (23) F4	6.85			SHEETS, ZINCGRIP Ingot Iron				Cleveland J5	6.70			A10 Armco Steel Corp.	C22 Claymont Steel Corp.		H1 Hanna Furnace Corp.				
ROOFING SHORT TERNES				Butler, Pa. A10	5.30			Cleveland A7	6.55			A11 Atlantic Steel Co.			I-1 Igoe Bros. Inc.				
(8 lb. Coated)				Middletown, O. A10	5.30			Dover, O. G6	7.30			A13 American Cladmetals Co.			I-2 Inland Steel Co.				
Gary, Ind. U5	9.50			SHEETS, ALUMINIZED				Fontana, Calif. K1	6.95						I-3 Interlake Iron Corp.				
				Butler, Pa. A10	8.15			Lackawanna, N.Y. B2	6.40						I-4 Ingersoll Steel Div.,				
								Sharon, Pa. S3	6.55						Borg-Warner Corp.				
								Sparrows Point, Md. B2	6.40						J1 Jackson Iron & Steel Co.				
								Warren, O. R2	6.55						J3 Jessop Steel Co.				
								Weirton, W. Va. W6	7.20						J4 Johnson Steel & Wire Co.				
								Youngstown Y1	7.05						J5 Jones & Laughlin Steel				
															J6 Joslyn Mfg. & Supply				
															J7 Judson Steel Corp.				
															J8 Jersey Shore Steel Co.				
															K1 Kaiser Steel Corp.				
															K2 Keokuk Electro Metals				
															K3 Keystone Drawn Steel				
															K4 Keystone Steel & Wire				
															K1 Laclede Steel Co.				
															L2 LaSalle Steel Co.				
															L3 Latrobe Electric Steel				
															L4 Lockhart Iron & Steel				
															L6 Lone Star Steel Co.				
															L7 Lukens Steel Co.				

MARKET PRICES

STRIP, Hot-Rolled Ingot Iron			WIRE, Manufacturers Bright, Low Carbon			WIRE, MB Spring, High Carbon			WIRE, Barbed			NAILS & STAPLES, Stock		
Ashland, Ky. (8) A10 .....3.75			Alabama City, Ala. R2 .....4.85			Albuquerque, Pa. J5 .....6.25			So. Chicago R2 .....140			To dealers & mfrs. (7) Col.		
Warren, O. R2 .....4.10			Albuquerque, Pa. J5 .....4.85			Alton, Ill. L1 .....6.45			Tonawanda, N.Y. B12 .....140			Alabama City, Ala. R2 .....118		
STRIP, Cold-Rolled Ingot Iron			Atlanta A11 .....5.10			Bartonsville, Ill. (1) K4 .....6.25			Williamsport, Pa. S19 .....150			Albuquerque, Pa. (13) J5 .....118		
Warren, O. R2 .....5.25			Alton, Ill. L1 .....5.05			Buffalo W12 .....6.25			WIRE, Barbed			Atlanta A11 .....121		
TIGHT COOPERAGE HOOP			Bartonsville, Ill. (1) K4 .....4.85			Cleveland A7 .....6.25			Alabama City, Ala. R2 .....136			Bartonsville, Ill. (19) K4 .....118		
Atlanta A11 .....4.05			Buffalo W12 .....4.85			Donora, Pa. A7 .....6.25			Albuquerque, Pa. J5 .....140			Chicago, Ill. W13 .....118		
Riverdale, Ill. A1 .....3.90			Chicago W13 .....5.10			Duluth A7 .....6.25			Atlanta A11 .....143			Cleveland A9 .....125		
Sharon, Pa. S3 .....4.15			Cleveland A7, C20 .....4.85			Fostoria, O. S1 .....6.25			Bartonsville, Ill. (19) K4 .....143			Crawfordsville, Ind. M8 .....122		
Youngstown U5 .....3.75			Crawfordsville, Ind. M8 .....5.10			Johnstown, Pa. B2 .....6.25			Crawfordsville, Ind. M8 .....145			Donora, Pa. A7 .....118		
WIRE, Merchant Quality			Donora, Pa. A7 .....4.85			Los Angeles B3 .....7.20			Donora, Pa. A7 .....140			Duluth, Minn. A7 .....118		
(6 to 8 gage)			Duluth, Pa. A7 .....4.85			Milbury, Mass. (12) N6 .....8.05			Duluth, Minn. A7 .....140			Fairfield, Ala. T2 .....118		
Alabama City R2 5.70 5.95			Fairfield, Ala. T2 .....4.85			Monessen, Pa. P7, P16 .....6.25			Houston, Tex. S5 .....148			Galveston, Tex. D7 .....126		
Albuquerque J5 5.70 6.15			Fostoria, O. (24) S1 .....5.35			Palmer, Mass. W12 .....6.55			Johnstown, Pa. B2 .....140			Houston, Tex. S5 .....126		
Atlanta A11 5.95 6.40			Houston S5 .....5.25			Pittsburg, Calif. C11 .....7.20			Joliet, Ill. A7 .....140			Johnstown, Pa. B2 .....118		
Bartonsville (19) K4 5.70 6.15			Johnstown, Pa. B2 .....4.85			Roebling, N.J. R5 .....6.55			Kansas City, Mo. S5 .....152			Joliet, Ill. A7 .....118		
Buffalo W12 4.85 5.15			Joliet, Ill. A7 .....4.85			Portsmouth, O. P12 .....6.25			Kokomo, Ind. C16 .....142			Kansas City, Mo. S5 .....130		
Cleveland A7 5.70 6.15			Kansas City, Mo. S5 .....5.45			So. Chicago, Ill. R2 .....6.25			Kokomo, Ind. C16 .....142			Kokomo, Ind. C16 .....120		
Crawfordsville M8 5.95 6.40			Kokomo, Ind. C16 .....4.95			So. San Francisco C10 .....7.20			Minneapolis, Colo. C10 .....146			Minneapolis, Colo. C10 .....123		
Donora, Pa. A7 5.70 6.15			Los Angeles B3 .....5.80			Sparrows Point, Md. B2 .....6.35			Monessen, Pa. P7 .....145			Monessen, Pa. P7 .....124		
Duluth, Minn. A7 5.70 6.15			Minneapolis, Colo. C10 .....5.10			Struthers, O. Y1 .....6.25			Pittsburg, Calif. C11 .....160			Pittsburg, Calif. C11 .....137		
Fairfield T2 5.70 6.15			Monessen, Pa. P7 .....5.10			Trenton, N.J. A7 .....6.55			Portsmouth, O. (18) P12 .....147			Portsmouth, O. P12 .....124		
Houston, Tex. S5 6.10 6.55			Newark, 6-8 ga. I-1 .....5.50			Waukegan, Ill. A7 .....6.25			Rankin, Pa. A7 .....140			Rankin, Pa. A7 .....118		
Johnstown B2 5.70 6.15			So. Tonawanda B11 .....4.85			Worcester A7, T6, W12 .....6.55			So. Chicago, Ill. R2 .....136			So. Chicago, Ill. R2 .....118		
Joliet, Ill. A7 5.70 6.15			Palmer, Mass. W12 .....5.15			Worcester, Mass. J4 .....6.75			So. San Fran., Calif. C10 .....160			Sparrows Point, Md. B2 .....120		
Kansas City, Mo. S5 6.30 6.75			Pittsburg, Calif. C11 .....5.80			WIRE, Upholstery Spring			Sparrows Point, Md. B2 .....142			Sterling, Ill. (1) N15 .....118		
Kokomo C16 5.80 6.05			Portsmouth, O. P12 .....5.25			Albuquerque, Pa. J5 .....5.90			Sterling, Ill. (1) N15 .....140			Torrance, Calif. C11 .....138		
Los Angeles B3 6.65			Rankin, Pa. A7 .....4.85			Alton, Ill. L1 .....6.10			BALE TIES, Single Loop			Worcester, Mass. A7 .....124		
Minneapolis C10 5.95 6.45			So. Chicago, Ill. R2 .....4.85			Buffalo W12 .....5.90			Alabama City, Ala. R2 .....123			STANDARD TRACK SPIKES		
Monessen P7 5.95 6.40			So. San Francisco C10 .....5.80			Cleveland A7 .....5.90			Atlanta A11 .....126			Ind. Harbor, Ind. I-2, Y1 .....6.15		
Palmer W12 5.15			Sparrows Point, Md. B2 .....4.95			Donora, Pa. A7 .....5.90			Bartonsville, Ill. (19) K4 .....123			Kansas City, Mo. S5 .....6.40		
Pitts., Calif. C11 6.65 6.80			Sterling, Ill. (1) N15 .....4.85			Duluth, Minn. A7 .....5.90			Crawfordsville, Ind. M8 .....132			Lebanon, Pa. B2 .....6.15		
Portsmouth (18) P12 6.10 6.60			Struthers, O. Y1 .....4.85			Johnstown, Pa. B2 .....5.90			Donora, Pa. A7 .....123			Minneapolis, Colo. C10 .....6.15		
Rankin A7 5.70 6.15			Torrance, Calif. C11 .....5.80			Los Angeles B3 .....6.85			Duluth, Minn. A7 .....123			Pittsburgh J5 .....6.15		
So. Chicago R2 5.70 5.95			Waukegan, Ill. A7 .....4.85			Monessen, Pa. P7, P16 .....5.90			Fairfield, Ala. T2 .....123			Pittsburgh J5 .....6.65		
So. S. Fran. C10 6.65 7.10			Worcester, Mass. A7, T6, S15 .....4.85			New Haven, Conn. A7 .....6.20			Joliet, Ill. A7 .....123			Seattle B3 .....6.15		
Sparrows Pt. B2 5.80 6.25			WIRE, Cold-Rolled Flat			Palmer, Mass. W12 .....6.20			Kansas City, Mo. S5 .....135			So. Chicago, Ill. R2 .....6.15		
Sterling, Ill. (1) N15 5.70 6.15			Anderson, Ind. G6 .....6.20			Pittsburg, Calif. C11 .....6.85			Kokomo, Ind. C16 .....125			Struthers, O. Y1 .....6.15		
Struthers, O. Y1 5.70 6.15			Buffalo W12 .....6.35			Portsmouth, O. P12 .....5.90			Kokomo, Ind. C16 .....128			Youngstown R2 .....6.15		
Torrance, Cal. C11 6.85			Cleveland A7 .....5.85			Roebling, N.J. R5 .....6.20			Minneapolis, Colo. C10 .....128			TRACK BOLTS (20) Treated		
Worcester A7 6.00 6.45			Crawfordsville, Ind. M8 .....6.20			So. Chicago, Ill. R2 .....5.90			Pittsburg, Calif. C11 .....147			Kansas City, Mo. S5 .....9.85		
WIRE (16 gage)			Detroit D2 .....6.20			So. San Francisco C10 .....6.85			So. Chicago, Ill. R2 .....123			Lebanon, Pa. (32) B2 .....9.85		
Albuquerque J5 10.15 12.15			Dover, O. G6 .....6.20			Sparrows Point, Md. B2 .....6.00			So. San Fran., Calif. C10 .....147			Minneapolis, Colo. C10 .....9.85		
Bartonsville (1) K4 10.25 11.95			Fostoria, O. S1 .....6.00			Torrance, Calif. C11 .....6.85			Sparrows Point, Md. B2 .....125			Pittsburgh O3, P14 .....9.85		
Cleveland A7 10.25 12.15			Kokomo, Ind. C16 .....5.70			Trenton, N.J. A7 .....6.20			Sterling, Ill. (1) N15 .....123			Seattle B3 .....10.35		
Crawfordsville M8 10.30 12.00			Franklin Park, Ill. T6 .....6.20			Waukegan, Ill. A7 .....5.90			NAILS & STAPLES, Non-Stock			TIE PLATES		
Fostoria, O. S1 10.40 13.00			Massillon, O. R3 .....5.85			Worcester, Mass. A7 .....6.20			Alabama City, Ala. R2 .....6.10			Fairfield, Ala. T2 .....4.50		
Johnstown B2 10.25 12.15			Monessen, Pa. P16 .....5.85			WOVEN FENCE, 9-1 1/2" Ga. Col.			Bartonsville, Ill. (19) K4 .....5.95			Gary, Ind. U5 .....4.50		
Kokomo C16 10.25 11.95			Monessen, Pa. P7 .....6.10			Alabama City, Ala. R2 .....126			Crawfordsville, Ind. M8 .....6.30			Ind. Harbor, Ind. I-2 .....4.50		
Minneapolis C10 10.40 12.40			New Haven, Conn. D2 .....6.50			Ala. City, Ala., 17-18 ga. R2 .....213			Donora, Pa. A7 .....5.95			Lackawanna, N.Y. B2 .....4.50		
Palmer, Mass. W12 10.25 12.15			Pawtucket, R.I. (12) N8 .....6.85			Albuquerque, Pa. 9-1 1/4 ga. J5 .....130			Duluth, Minn. A7 .....5.95			Minneapolis, Colo. C10 .....4.50		
Pitts., Cal. C11 10.60 12.50			Trenton, N.J. R5 .....6.15			Atlanta A11 .....133			Johnstown, Pa. B2 .....5.95			Pittsburg, Calif. C11 .....4.65		
Portsmouth (18) P12 10.55 12.30			Worcester T6 .....6.50			Bartonsville, Ill. (19) K4 .....130			Kokomo, Ind. C16 .....6.05			Seattle B3 .....4.65		
Sparrows Pt. B2 10.35 12.25			Worcester W12 .....6.65			Crawfordsville, Ind. M8 .....132			Minneapolis, Colo. C10 .....6.20			Steelton, Pa. B2 .....4.50		
Waukegan A7 10.25 12.15			WIRE, Fine & Weaving (8" Coils)			Donora, Pa. A7 .....130			Pittsburg, Calif. C11 .....6.90			Torrance, Calif. C11 .....4.65		
ROPE WIRE			Bartonsville, Ill. (1) K4 .....8.90			Duluth, Minn. A7 .....130			Portsmouth, O. P12 .....6.25			JOINT BARS		
(A) (B)			Buffalo W12 .....8.90			Fairfield, Ala. T2 .....130			Rankin, Pa. A7 .....5.95			Bessemer, Pa. U5 .....4.70		
Alton, Ill. L1 8.65 8.90			Chicago W13 .....8.90			Houston, Tex. S5 .....138			So. Chicago, Ill. R2 .....6.10			Fairfield, Ala. T2 .....4.70		
Bartonsville, Ill. K4 8.55 8.80			Cleveland A7 .....8.90			Johnstown, Pa. B2 .....130			Sparrows Point, Md. B2 .....6.05			Ind. Harbor, Ind. I-2 .....4.70		
Buffalo W12 8.55 8.80			Crawfordsville, Ind. M8 .....8.95			Johnstown, 17 ga., 4" B2 .....204			Sterling, Ill. (1) N15 .....5.65			Joliet, Ill. U5 .....4.70		
Fostoria, O. S1 8.55 9.10			Fostoria, O. S1 .....8.90			Joliet, Ill. A7 .....130			Worcester, Mass. A7 .....6.25			Lackawanna, N.Y. B2 .....4.70		
Johnstown, Pa. B2 8.55 8.80			Kokomo, Ind. C16 .....8.90			Kansas City, Mo. S5 .....142			NAILS, Cut (100 lb keg)			Minneapolis, Colo. C10 .....4.70		
Monessen, Pa. P16 8.55 8.80			Kokomo, Ind. C16 .....8.90			Kokomo, Ind. C16 .....132			To dealers (33)			Steelton, Pa. B2 .....4.70		
Monessen, Pa. P7 8.80 9.05			Monessen, Pa. P16 .....8.90			Minneapolis, Colo. C10 .....138			Conshohocken, Pa. A3 .....\$7.35			AXLES		
Palmer, Mass. W12 8.85 9.10			Palmer, Mass. W12 .....9.20			Monessen, Pa. P7 .....135			Wheeling, W. Va. W10 .....7.35			Ind. Harbor, Ind. S18 .....5.60		
Portsmouth, O. P12 8.55 8.80			Portsmouth, O. P12 .....8.90			Pittsburg, Calif. C11 .....153			RAILS			Johnstown, Pa. B2 .....5.60		
Roebling, N.J. R5 8.85 9.10			Roebling, N.J. R5 .....9.20			Portsmouth, O. (18) P12 .....137			Bessemer, Pa. U5 .....3.60			Std. Tee Rails		
Sparrows Pt. B2 8.65 8.90			Waukegan, Ill. A7 .....8.90			Rankin, Pa. A7 .....130			Ensley, Ala. T2 .....3.60			No. 1 Under		
Struthers, O. Y1 8.55 8.80			Worcester, Mass. A7, T6 .....9.20			So. Chicago, Ill. R2 .....126			Fairfield, Ala. T2 .....3.60			No. 2 4.00		
Worcester J4, T6 8.85 9.10			WIRE, Galv'd ACSR for Cores			Sterling, Ill. (1) N15 .....130			Gary, Ind. U5 .....3.60			No. 2 4.00		
			Bartonsville, Ill. K4 .....8.50			FENCE POSTS			Huntington, W. Va. W7 .....3.60			No. 2 5.00		
			Monessen, Pa. P16 .....8.50			Chicago Hts., Ill. C2 .....140			Ind. Harbor, Ind. I-2 .....3.60			No. 2 4.00		
			Palmer, Mass. W12 .....9.20			Duluth, Minn. A7 .....125			Johnstown, Pa. B2 .....3.60			No. 2 4.50		
			Portsmouth, O. P12 .....8.90			Franklin, Pa. F5 .....140			Lackawanna B2 .....3.60			No. 2 4.50		
			Roebling, N.J. R5 .....9.20			Huntington, W. Va. W7 .....140			Minneapolis, Colo. C10 .....3.60			No. 2 4.50		
			Sparrows Point, Md. B2 .....8.60			Johnstown, Pa. B2 .....140			Steelton, Pa. B2 .....3.60			No. 2 4.75		
			Johnstown, Pa. B2 .....8.50			Marion, O. P11 .....140			Williamsport, Pa. S19 .....3.60					
			WIRE, Tire Bead			Minneapolis, Colo. C10 .....130								
			Bartonsville, Ill. (1) K4 .....10.90			Moline, Ill. R2 .....136								
			Monessen, Pa. P16 .....11.40											
			Roebling, N.J. R5 .....11.55											



20th Century
the persuasive abrasive

Saves you
**GOOD
ROUND DOLLARS**

This uniform, perfectly round *Normalized malleable-type shot is bound to save you perfectly good round dollars.

It wears 3 times longer than conventional shot.

*Copyrighted Trade Name

THE CLEVELAND  **CO.**

884 East 67th Street Cleveland 8, Ohio
Howell Works: Howell, Michigan

One of the world's largest
producers of quality shot and
grit—Normalized—Hard Iron
—Cut Wire.

STANDARD PIPE, T. & C.

BUTT WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, %				
			Black		Galvanized		
			A	C	D	E	F
1/8	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5 +3.5
1/4	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0 +6.0
3/8	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0 +12.0
1/2	8.5	0.85	36.0	34.0	35.0	14.0	12.0 13.0
3/4	11.5	1.18	39.0	37.0	38.0	18.0	16.0 17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5 20.5
1 1/4	23.0	2.28	42.0	44.0	41.0	22.0	24.0 21.0
1 1/2	27.5	2.78	42.5	41.5	41.5	23.0	21.5 22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5 22.5
2 1/2	58.5	5.82	43.5	41.5	42.5	24.0	22.0 23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0 23.0

Column A: Etna, Pa. N2; Butler, Pa. 1/4-3/4, F6; Benwood, W. Va., 3/4 points lower on 1/4", 1 1/2 points lower on 1/2", and 2 points lower on 3/4", W10; Sharon, Pa. M6, 1 point higher on 1/4", 2 points lower on 1/2" and 3/4". Following make 1/4" and larger: Lorain, O., N3; Youngstown R2 and 3 1/2" on 3/4" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 1 1/2 points lower on 1/2" and larger continuous weld and 24% on 3 1/2" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., 1/2" through 3", Y1; Alton, Ill., 2 points lower discount L1.

Column D: Butler, Pa. F6, 1/4-3/4; Benwood, W. Va. W10, except plus 3 1/2% on 1/4", plus 2 1/2% on 1/2", plus 9% on 3/4"; Sharon, Pa. M6, plus 0.5 on 1/4", 1 point lower on 1/2", 1 1/2 points lower on 1" and 1 1/4", 2 points lower on 1 1/2", 2", 2 1/2" and 3". Following quote only on 1/2" and larger: Lorain, O. N3; Youngstown R2, and 1 1/2% on 3 1/2" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on 3/4", 2 points lower on 1", 1 1/2 points lower on 1 1/4", 2 points lower on 1 1/2" and 2" 1 1/2 points lower on 2 1/2" and 3"; Etna, Pa. N2 and 18 1/2% on 3 1/2" and 4".

SEAMLESS AND ELECTRIC WELD	List Per Ft	Pounds Per Ft	Carload Discounts from List, %			
			Seamless		Elec. Weld	
Size Inches			Black	Galv.	Black	Galv.
2	37.0c	3.68	29.5	9.5	29.5	9.5
2 1/2	58.5	5.82	32.5	12.5	32.5	12.5
3	78.5	7.62	32.5	12.5	32.5	12.5
3 1/2	92.0	9.20	34.5	14.5	34.5	14.5
4	\$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1 1/2 pts lower on 2", 1 pt lower on 2 1/2-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	Seamless		Elec. Weld	
		H.R.	C.D.	H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1 1/4	13	16.09	19.71	15.61	18.19
1 1/2	13	17.27	21.15	17.25	20.30
1 3/4	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2 1/4	13	24.35	29.82	24.50	28.84
2 1/2	12	26.92	32.97	26.98	31.76
2 3/4	12	29.65	36.32	29.57	34.76
3	12	32.11	39.33	31.33	36.84
3 1/2	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding	Plates		Cold-Rolled Carbon Base		Sheets		Cu Base
	10%	20%	Both Sides	Both Sides	Both Sides	Both Sides	
Stainless	10%	20%	10%	20%	10%	20%	
302	25.00	29.50	19.75	26.24	27.50	77.00	
304	25.00	29.50	24.50	27.50	27.77	77.00	
309	30.50	35.00					
310	36.50	41.00				144.00	
316	29.50	34.00	26.00	35.92	36.50		
317	34.50	39.00					
318	33.50	38.00					
321	26.50	31.00	23.00	33.00	111.00		
347	27.50	32.00	24.00	33.50	130.00		
405	21.25	27.75					
410	20.75	27.25					
Nickel	33.55	45.15	41.00	54.00			
Inconel	41.23	54.18				165.00	
Monel	34.93	46.28					
Copper*			23.70	29.65			

*Deoxidized. †20.20c for hot-rolled. ‡26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS (F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
1/2-in. & smaller diam.	15
3/4-in. & 1-in.	18.5
1 1/4-in. & larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage Bolt	18.5
Blank	34
Plow	34
Step, Elevator, Tap, and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

H.P. & C.P. Reg. Hvy.

Square:	
1/2-in. & smaller	15
3/4-in. & 1-in.	12
1 1/4-in. & larger	9
1 1/2-in. & larger	7.5
H.P. Hex.:	
1/2-in. & smaller	26
3/4-in. & 1-in.	16.5
1 1/4-in. & larger	12
1 1/2-in. & larger	8.5
C.P. Hex.:	
1/2-in. & smaller	26
3/4-in. & 1-in.	23
1 1/4-in. & larger	19.5
1 1/2-in. & larger	12

SEMI-FINISHED NUTS American Standard

(Per cent off list for less than case or key quantities)

Reg. Hvy.	
1/2-in. & smaller	35
3/4-in. & 1-in.	28.5
1 1/4-in. & larger	24
1 1/2-in. & larger	13
Light	
1/2-in. & smaller	35
3/4-in. & 1-in.	28.5
1 1/4-in. & larger	26

STEEL STOVE BOLTS (F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS (1020 steel; packaged; per cent off list)

6 in. or shorter:	
1/2-in. & smaller	42
3/4-in. through 1 in.	34
Longer than 6 in.:	
1/2-in. & smaller	26
3/4-in. through 1 in.	4

SQUARE HEAD SET SCREWS (Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS (Packaged; per cent off list)

No. 10 and smaller	35
1/4-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F. o. b. midwestern plants Structural 1/2-in., larger 7.85c 1/4-in. under 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers. List to list-plus-\$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content, 70%, \$43; 60%, \$40. Imported, net ton, duty paid, metallurgical grade, \$33-\$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches	Length	Cents per lb
Diam.		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
35, 40	110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
17 to 20	34, 90	8.03

STAINLESS STEEL

Type	Sheets	C.R.
301...	41.00	34.00
302...	41.25	36.75
303...	43.25	40.25
304...	43.25	38.75
309...	56.00	55.00
316...	57.00	59.00
321...	49.25	48.25
347...	53.75	52.25
410...	36.50	30.50
416...	37.00	37.00
420...	44.00	47.00
430...	39.00	31.00
501...	27.50	28.00
502...	28.50	27.00

quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00 on Type 301; 36.50, 302; 38.50, 304; 58.50, 306; 52.00, 347; 30.50, 410; 31.00, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & Strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structural U5.

Syracuse, N. Y., bars, wire & structural C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00, strip 64.00 W4.

Watervliet, N. Y., structural & bars A4 quotes slight variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 and 34.25 on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	30.00-35.00
Toluene, one deg.	26.00-33.00
Industrial xylol	25.00-33.50
Per ton bulk, ovens	
Sulphate of ammonia	\$32-\$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron Cents

98+ % Fe, carlots.. 17.00

Swedish, c.i.f. New York, in bags ..8.85-9.95

Electrolytic Iron:

Annealed, 99.5% Fe. 42.50

Unannealed, 99+ % Fe .. 36.50

Unannealed, 99+ % Fe (minus 325 mesh) .. 58.50

Powder Flakes .. 48.50

Carbonyl Iron:

97.9-99.8%, size 5 to 10 microns ..\$3.00-148.00

Aluminum:

Carlots, freight allowed .. 29.50

Atomized, 500 lb drums, freight allowed .. 33.50

Antimony .. 75.85

Brass, 10-ton lots 30.00-33.25

Bronze, 10-ton lots .. 51.25-60.00

Phosphor-Copper, 10 ton lots .. 50.00

Copper:

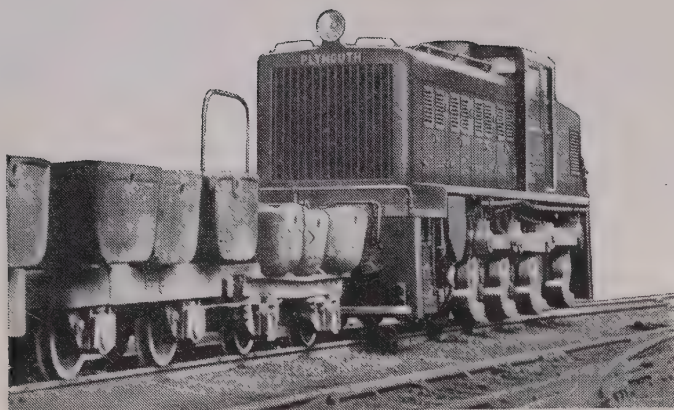
Electrolytic .. 37.25-46.25

Reduced .. 33.75-37.00

Lead .. 25.50

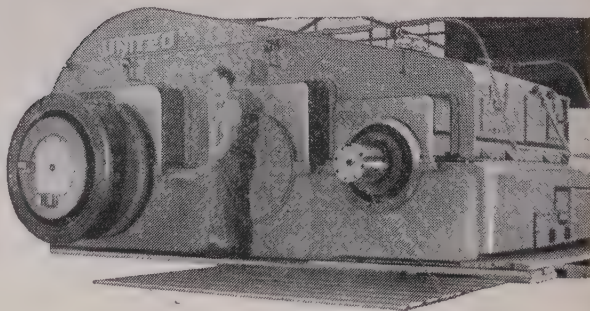
Magnesium .. 75.00-85.00

Manganese:



SKF-equipped Plymouth Locomotive Works Flexomotive.

SKF-equipped United Engineering Company Sheet Mill.



why do so many prefer SKF?

It's pretty hard *not* to buy good bearings today, but SKF is the preferred bearing with many a manufacturer of metal mill equipment.

There are good reasons why!

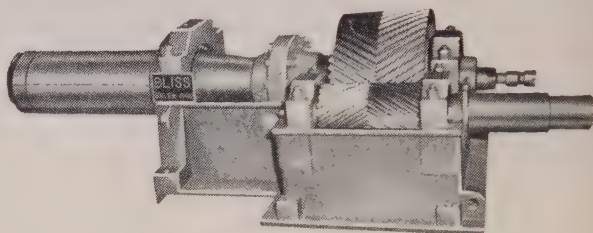
These manufacturers know SKF as a reliable, friendly supplier. They've learned to have implicit confidence in the experienced bearing engineering specialists at SKF's headquarters. They appreciate the teamwork of SKF field men who are qualified specialists in the application of bearings to metal mill equipment.

Their customers know the value of the complete maintenance service available to them through SKF's Distributor Organization.

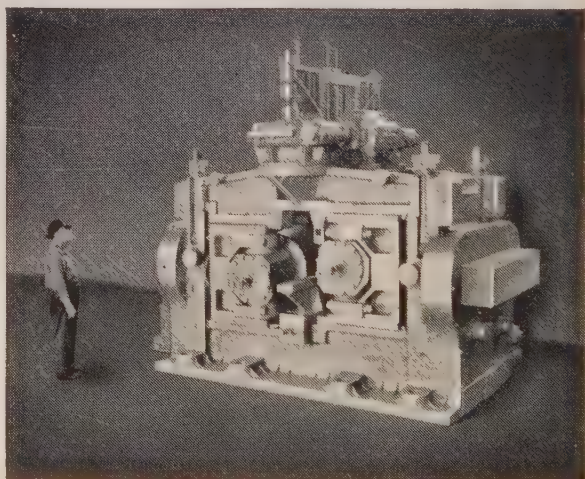
Whatever your product, your engineers and designers can have this helpful SKF teamwork simply by asking for it.

7285

SKF-equipped E. W. Bliss Company Tension Reel.



SKF-equipped Aetna-Standard Engineering Company Reeling Machine.



SKF

BALL AND ROLLER BEARINGS



WHY SKF IS PREFERRED BY ALL INDUSTRY

integrity • craftsmanship • metallurgy
tolerance control • surface finish
product uniformity • engineering service
field service

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.—manufacturers of SKF and HESS-BRIGHT bearings.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS		Standard Structural Shapes	PLATES	
	H.R. 18 Ga. Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140s	Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	7.83
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	7.68
Phila. (city)	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	7.40
Phila. (c'try)	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††	6.00	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††	5.80	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.85-5.95	6.90	5.55	6.40	10.10††	5.70	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	9.82	5.92
Cincinnati (city)	6.02	6.59	7.84	5.95	...	5.95	6.51	...	6.24	6.24
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60
KansCity (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40
Birm'hm (city)	5.75	6.55	8.00	5.70	...	5.70	7.53	...	5.85	6.10
Birm'hm (w'hse)	5.60	6.40	7.75	5.55	...	5.55	7.53	...	5.70	5.95
Los Ang. (city)	6.55	8.10	9.05	6.60	8.90	6.55	7.75	...	6.65	6.80
L. A. (w'hse)	6.35	7.90	8.85	6.40	8.70	6.35	7.55	...	6.45	6.60
San Francisco	6.65	7.80	8.90	6.60	...	6.45	8.20	...	6.45	6.60
Seattle-Tacoma	7.05	8.60	9.20	7.30	...	6.75	9.10	11.15	6.65	6.75

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ¶ as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; 2—500 to 1499 lb; 3—450 to 1499 lb; 4—3500 lb and over; 5—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	\$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates	
contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	
Spot	17.00
Long-term contract	15.00
North African hematites	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	\$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, \$1.18-\$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	\$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	\$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	\$32.00
----------------	---------

Rhodesian

45% no ratio	\$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	\$39.00
---------	---------

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	\$1.00
---	--------

REFRACTORIES

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., \$116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., \$156.20.

High-Heat Duty: Salina, Pa., \$99.60, Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, Ottawa, Ill., \$94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., \$88; Bessemer, Ala., \$79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., \$79.20; Farral, O., \$78.50; St. Marys, Pa., \$76; Ottawa, Ill., \$70.

Ladle Brick

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merrill Station, Clearfield, Pa., Irondale, Wellsville, O., \$66.

Wire Cut: Chester, Wellsville, O., \$64.

Malleable Bung Brick

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., \$105.60; Beach Creek, Pa., \$94.60; Ottawa, Ill., \$90.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., \$94.60; Hays, Pa., \$100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., \$104.50; Lehi, Utah, Los Angeles, Ind., \$111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, \$92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., \$93.50.

Basic Brick

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, \$73-\$78; chemical-bonded chrome brick, \$77-\$82; magnesite brick, \$99-\$104; chemical-bonded magnesite, \$88-\$93.

Magnesite

Per net ton, Chewelah, Wash. Domestic dead-burned, ¾" grains; bulk, \$36.30; single paper bags, \$41.80.

Dolomite

Per net ton. Domestic burned bulk; Bonne Terre, Mo., \$12.15; Martin, Millersville, Nario, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., \$13.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Delid. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.i. lump, bulk 7.0c per lb of alloy, c.i. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Delid. Add 0.25c for nothing. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.i. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for nothing. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.i. bulk 11.15c, per lb of briquet, c.i. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for nothing. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.i. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.i. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for nothing, small size only. Spot, add 0.25c.

Molybdenum-Oxide Briquets: (Containing 2½ lb of Mo each) \$1.14 per pound of Mo contained, f.o.b. Langloeth, Pa.

NOTE: For current quotations on manganese, titanium and "other" ferroalloys, see page 151, Sept. 24 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 147, Oct. 1 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP
COMPOSITE

Oct. 4	\$44.00
Sept. 27	44.00
July 1951	44.00
Aug. 1950	40.00
Aug. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade) 1	Dealer	Industrial	Railroad
Basing Point			
Alabama City, Ala.	\$39.00	\$41.00	
Ashland, Ky.	42.00	44.00	
Atlanta, Ga.	39.00	41.00	
Bethlehem, Pa.	42.00	44.00	
Birmingham, Ala.	39.00	41.00	
Brackenridge, Pa.	44.00	46.00	
Buffalo, N. Y.	43.00	45.00	
Butler, Pa.	44.00	46.00	
Canton, O.	44.00	46.00	
Chicago, Ill.	42.50	44.50	
Cincinnati, O.	43.00	45.00	
Claymont, Del.	42.50	44.50	
Cleveland, O.	43.00	45.00	
Coatesville, Pa.	42.50	44.50	
Conshohocken, Pa.	42.50	44.50	
Detroit, Mich.	41.15	43.15	
Duluth, Minn.	40.00	42.00	
Harrisburg, Pa.	42.50	44.50	
Houston, Tex.	37.00	39.00	
Johnstown, Pa.	44.00	46.00	
Kansas City, Mo.	39.50	41.50	
Kokomo, Ind.	42.00	44.00	
Los Angeles	35.00	37.00	
Midland, O.	43.00	45.00	
Midland, Pa.	44.00	46.00	
Minneapolis, Colo.	38.00	40.00	
Monsen, Pa.	44.00	46.00	
Phoenixville, Pa.	42.50	44.50	
Pittsburgh, Calif.	35.00	37.00	
Pittsburgh, Pa.	44.00	46.00	
Portland, Ore.	35.00	37.00	
Portsmouth, O.	42.00	44.00	
St. Louis, Mo.	41.00	43.00	
San Francisco	35.00	37.00	
Seattle, Wash.	35.00	37.00	
Sharon, Pa.	44.00	46.00	
Sparrows Point, Md.	42.00	44.00	
Steubenville, O.	44.00	46.00	
Warren, O.	44.00	46.00	
Weirton, W. Va.	44.00	46.00	
Youngstown, O.	44.00	46.00	

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—\$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structural & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

- (1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
- (2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
- (3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
- (4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.
- (5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

- (1) Sellers of Grades 26 and 27 may make an extra charge of \$1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
- (2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, \$6; 75% and over, \$10; less than 75%, \$12.
- (3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less \$15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.	
2. No. 2 Heavy Melting Steel	—\$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheels.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3	Base
oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

- (1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.
- (2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
- (3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1.)

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	\$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

- (1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.
- (2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intranet preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

- (1) For preparing into Grades No. 1, No. 2 or No. 3, \$8.
- (2) For hydraulically compressing Grade No. 4, \$6 per ton; Grade No. 5, \$8.
- (3) For crushing Grade No. 6, \$3.
- (4) For preparing into Grade No. 25, \$6.
- (5) For preparing into Grade No. 19, \$6.
- (6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, \$10.
- (7) For preparing into Grade No. 17 or Grade No. 21, \$11.
- (8) For preparing into Grade No. 18 or Grade No. 20, \$12.
- (9) For hydraulically compressing Grade No. 15, \$8.
- (10) For preparing into Grade No. 28, \$10.

Ceiling fees per gross ton which may be charged for intranet preparation of any grade of steel scrap of railroad origin shall be:

- (1) For preparing into Grade No. 1 and Grade No. 2, \$8.
- (2) For hydraulically compressing Grade No. 13, \$6.
- (3) For preparing into Grade No. 16, \$4.
- (4) For preparing into Grade No. 17, \$5.
- (5) For preparing into Grade No. 18, \$7.
- (6) For preparing into Grade No. 21, \$4.
- (7) For preparing into Grade No. 23, \$4.

Ceiling fees per gross ton which may be charged for intranet preparation of cast iron are limited to:

- (1) For preparing Grade No. 8 into grade No. 7, \$9.
- (2) For preparing Grade No. 3 into Grade No. 11, \$7.
- (3) For preparing Grade No. 3 into Grade No. 1, \$4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such

scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of \$1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be \$8 per ton beneath ceiling of the prepared base grades. For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be \$6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be \$8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: \$1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; \$2 per ton for scrap containing not less than 0.15 per cent molybdenum and \$3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, \$4 for scrap in sizes larger than 12 x 24 x 8 in., and \$14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); \$1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton: Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c; Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c; Canton, O., 51c; Chicago (including Gary, Ind.), \$1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c; Coatesville, Pa., 50c; Conshohocken, Pa., 20c; Detroit, 95c; Duluth, Minn., 50c; Harrisburg, Pa., 51c; Houston, Tex., 57c; Johnstown, Pa., 75c; Kansas City, Mo., 78c; Kokomo, Ind., 51c; Middletown, O., 26c; Midland, Pa., 75c; Minneapolis, Colo., 33c; Monessen, Pa., 51c; Phoenixville, Pa., 51c; Pittsburgh, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Ore., 52c; Portsmouth, O., 51c; St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c; Warren, Pa., 75c; Weirton, W. Va., 70c; Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)	
Heavy Melt	\$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd	33.00
Bushelings new factory, unprep'd	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

The Metal Market

Government moves to stabilize metal markets by raising lead and zinc prices, joining international copper and zinc allocation, releasing additional copper from stockpile

GOVERNMENT officials are moving swiftly to alleviate acute shortages in copper, lead and zinc. The actions taken so far will improve the overall situation but they do not surmount consumers' immediate problems of obtaining adequate supplies at reasonable prices.

OPS boosted prices of lead and zinc 2 cents a pound and fixed prices which may be paid for these imported metals at the domestic levels. Ceiling prices are 19.00c a pound, New York, for lead and 19.50c, East St. Louis, for zinc. They are on a delivered basis before payment, if any, of import tariff. The new ceilings do not apply to material in transit on Oct. 2 or purchased under a written contract made before that date, if the metal is shipped before Nov. 30 and copies of contracts are filed with OPS by Oct. 20.

Higher zinc and lead prices, while increasing costs of products fabricated from those metals, is regarded as a stabilizing factor by consumers. The increased costs probably will be passed on to users of fabricated products eventually. An increase in ceiling prices on scrap is expected to be announced soon.

Fewer Imports—Since prices for imported metal are set below present levels abroad, a slump in imports of lead and zinc are expected to result. Prices for foreign lead have been ranging from 21.50c to 22.50c a pound, Gulf ports, with the duty for account of the buyer. Principal seller of Mexican lead to consumers in this country immediately withdrew from the market pending determination of policy under the new circumstances. Foreign zinc prices have ranged upward from 29.00c, f.a.s. Gulf ports.

The government hopes substantial arrest of the inflationary trend in nonferrous metals can be achieved by accompanying allocation of world supplies with price action. Upward revisions in domestic prices were made on the basis of increased costs which have limited the possibility of developing some mines and which have retarded production at some operating properties.

U. S. Gets Half of Supplies

Copper and zinc supplies will be allocated internationally in fourth quarter. The Copper-Zinc-Lead Committee, International Materials Conference, assigned about half of supplies to the United States. Requirements of copper and zinc in the fourth quarter, as determined by the committee, exceed refinery production by about 100,000 metric tons of each metal; 15.8 per cent in the case of copper and 21.4 per cent in the case of zinc.

The United States was awarded 333,770 metric tons of the 677,160

tons of copper divided among participating consumers and 228,460 tons of the 469,260 tons of zinc. Britain was assigned the second largest amount, or 91,690 tons of copper and 60,250 tons of zinc.

Allocations represent the amount of primary metal which may be consumed by the country concerned either from domestic production or imports. Participating countries are free to purchase from and to sell to any party within the limits of their allocation.

Chile, one of the world's key sources of copper, hedged its acceptance with a condition that it be allowed to sell 20 per cent of its output "without reference to the allocation scheme." Metal again is flowing from Chilean ports, following termination of a dockworkers' strike. Chile gets 70 per cent of its U. S. dollars from this \$100 million a year business.

An additional 30,000 tons of copper have been released from the government stockpile to provide metal for essential defense needs. This brings the total released to 55,000 tons.

Phelps-Dodge To Boost Output

Phelps-Dodge Corp. will step up production of copper for stockpiling and other defense needs by 38,000 tons a year. The metal will come from ore mined at the Bisbee east ore body of the corporation's Copper Queen branch at Bisbee, Ariz.

Under terms of an agreement with the government, Phelps-Dodge will undertake a \$25 million expansion program which includes construction of

a concentrating and leaching plant at the mine site, as well as enlargement of its smelter at Douglas, Ariz. With annual capacity of 38,000 tons, the new facilities are expected to go into production in late 1954 or early 1955.

Defense Minerals Procurement Agency will buy at 22.00c a pound up to 112,500 tons of the first 150,000 tons produced by the new facilities, providing the corporation cannot sell it to other purchasers in the United States at a higher price.

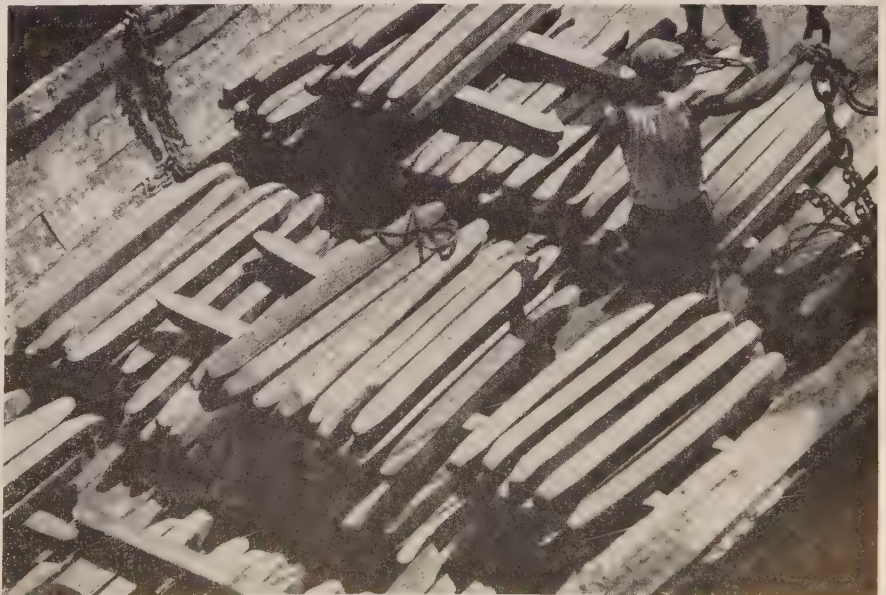
Northwest Power May Drop

Rains in the Pacific Northwest have eased temporarily the threatened power shortage. The situation remains precarious and rationing machinery has been set up in preparation for mandatory power cuts, if necessary. The aluminum industry, using normally about 36 per cent of the area's power, may have its share reduced to 24 per cent if and when it is limited to "firm" power supply.

Surplus Tin Output Forecast

A surplus of world tin production over consumption, amounting to 21,000 tons in 1951 and at least 16,000 tons in 1952, was forecast by representatives of principal tin producing and consuming countries attending the Rome conference which closed Sept. 28.

Consensus of producers was that the United States must either dip into her stockpile of an estimated 150,000 to 200,000 tons or resume purchases on the international market. American delegates gave no indication of what they believe to be a fair price for tin on the world market. Some producers mentioned \$1.25 a pound. The Bolivian delegate urged an increase in price to \$1.50 a pound.



CHILEAN DOCKWORKERS RESUME LOADING OF COPPER
... strike ends, exports move under international allocation

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.i. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XXX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, \$215-\$221 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, \$1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, \$2.55 del.; special or patented shapes \$2.80.

Cobalt: 97.99%, \$2.10 per lb for 500 lb (kegs); \$2.12 per lb for 100 lb (case); \$2.17 per lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: \$90-\$93 per ounce from refineries.

Palladium: \$24 per troy ounce.

Iridium: \$200 per troy ounce.

Titanium (sponge form): \$5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95%, 41.30; 90%, 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44. (Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.i. 28.67-30.42; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.i. 29.60-30.60, l.c.l. 30.10-31.10, 100,000 lb lots 29.35-30.35; magnet, del., 15,000 lb or more 34.50c, l.c.l. 35.25.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
1951								
Oct. 2-4	24.50	18.80	19.50	103.00	19.00	42.00	56.50	90.16
Oct. 1	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Sept. Aug.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	108.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.i. orders)

Sheets and Circles: 2S and 3S mill finish c.i.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round R317-T4, 17S-T4	Hexagonal R317-T4 17S-T4
0.125	52.0	...
0.156-0.0188	44.0	...
0.219-0.313	41.5	...
0.375	40.0	46.0
0.406	40.0	...
0.438	40.0	46.0
0.469	40.0	...
0.500	40.0	46.0
0.531	40.0	...
0.563	40.0	45.0
0.594	40.0	...
0.625	40.0	43.5
0.688	40.0	45.0
0.750-1.000	39.0	41.0
1.063	39.0	41.0
1.125-1.500	37.5	39.5
1.563	37.0	...
1.625	36.5	39.5
1.688-2.000	36.5	...

LEAD
(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more \$22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils \$22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC
Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL
(Base prices f.o.b. mill)
Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL
(Base prices, f.o.b. mill)
Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM
Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM
(Prices per lb, 10,000 lb and over, f.o.b. mill)
Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forgings, \$6; hot-rolled and forged bars, \$6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 35.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, \$1.19; 500 to 999 lb, \$1.195; 200 to 499 lb, \$1.20; less than 200 lb, \$1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb \$1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean	Rod	Clean
	Heavy	Ends	Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.625
80%	20.125	18.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.
Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass scrap 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unswaged zinc dross, 12.25c; new clippings and trimmings, 14.50c; engravers' and lithographers' plates, 14.50c; die cast slabs, mfn. 90% zinc, 12.25c; old zinc scrap, 11.25c; forming and stamping dies, 11.25c; new die cast scrap, 10.75c; old zinc die cast radiator grills, 10.50c; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

Plates . . .

Plate Prices, Page 263

Boston — While mills are taking higher rated orders for first quarter, they are doing so cautiously pending clarification of the distribution program. While a number of tickets issued under CMP have not been reduced, some individual allotments have been cut back.

New York — Plate consumers entertain little hope of getting additional tonnage on mill books for fourth quarter. Some have CMP tickets, but cannot find a mill that will accept the business.

Pittsburgh — Extent to which plate tonnage on mill books will be wiped out to make way for unplaced fourth quarter CMP tickets is uncertain. General trade opinion is practically all third quarter carryover not shipped by Oct. 7 will be charged against fourth quarter allotments.

Sheets, Strip . . .

Sheet and Strip Prices, Page 263 & 264

Pittsburgh — Sheetmakers express surprise at the latest government regulation ordering them to charge third quarter carryover not shipped by Oct. 7 against fourth quarter allotments. This move aimed at clearing producers' books of so-called duplicate orders to make way for fourth quarter CMP tickets still unplaced, will have serious impact on the market, in the opinion of producers. Carryover from third quarter was substantial. Shipment delays were occasioned in third quarter by imposition of government directives in rolling schedules, forcing producers to push deliveries on regular accounts into the future.

Boston — Cancellations of flat-rolled steel orders, due to CMP cutbacks, are light. Consumers confronted with a slack in production are seeking to defer shipments rather than cancel orders. Cuts in allotments for first quarter are bringing orders more in line with potential supply.

New York — Sheet consumers will not know until later this month what tonnage they will be permitted to place for the first quarter. They are now permitted to place up to 70 per cent of their fourth quarter quotas and certain quantities through the third quarter of next year.

Philadelphia — While all sheet mills are accepting routine CMP orders for first quarter, as well as especially classified military needs, there is still much confusion as to how far they can go in acceptance of such orders.

Cleveland — Some adjustments in sheet order books will likely result from the latest government regulation covering quarterly carryover tonnage. Under this regulation all third quarter tonnage not shipped by Oct. 7 is to be charged by the customer against his fourth quarter allotment. To what extent this will open up space in fourth quarter schedules for unplaced CMP tickets is uncertain. The load on the mills unquestionably will be eased, however.

Youngstown — The cold-rolled strip department at the Campbell works of Youngstown Sheet & Tube Co. has been idle the past three weeks, with 500 men out of work, because of a slowdown in production at the hot strip mill.

Cincinnati — Mills are reducing output of galvanized sheets in response to orders from Washington, based on need to conserve zinc.

Chicago — Sheetmakers have received no cancellations of tonnage thus refuting contention of NPA that mill orders books contain considerable duplication of tonnage. Output of galvanized sheets and strip is still limited by short zinc supply.

Tin Plate . . .

Tin Plate Prices, Page 264

Cleveland — Arbitrary cancelling of third quarter carryover under the latest government regulation may present tin plate producers with the problem of filling gaps in their fourth quarter schedules. Unlike other major products, consumers of tin plate are limited in number and if their certified take is cut down to the extent of carryover after Oct. 7 it is problematical whether the mills will get sufficient new tonnage to keep them fully occupied all through the period. As things now stand, customers are not standing in steel mill offices desperately seeking to place tin plate tonnage as is the case in bars, for example.

Tubular Goods . . .

Tubular Goods Prices, Page 267

Youngstown — Youngstown Sheet & Tube Co. last week closed down its No. 1 seamless tube mill at the Campbell works because of a shortage of tube rounds.

Steel Bars . . .

Bar Prices, Page 263

New York — Alloy and high-strength steel bar producers are experiencing a flurry in demand. Producers must accept for a 15-day period orders for January on a first-come-first-served basis to the extent of 10 per cent of scheduled capacity. Producers are required to set aside only 10 per cent of their output for these orders, indicating there will be a number of orders which cannot be entered. The 15-day period in which the mills have to accept carbon steel products on such a basis for January begins early in November.

Philadelphia — Bar producers are experiencing a little sample of what they expect to experience during the first 15 days of every month from now on. They are in receipt of a flurry of orders for January for alloy steels which require a 75-day lead-time. During this period, which falls prior to expiration of the lead time, producers must accept on a first-come-first-served basis CMP orders up to 10 per cent of their rated capacity for such products. Next month, and in succeeding months, there will not only be the flurry of orders for these products, but also for the heavy tonnage carbon products, which have a 45-day lead time. As the set-sides for this business are only 10 per cent, mills anticipate upon such occasions far more orders for tonnage than they can handle.

Pittsburgh — Barmakers are booking orders into first quarter cautiously. They are not inclined to take anything beyond except in the case

of military tonnage. Bars are in most acute supply of the hot-rolled products in this area and there is little prospect for any early improvement with consumer pressure unrelaxed.

Cleveland — Clearing away of the third quarter carryover by arbitrary ruling of the NPA will not make even a dent in the pileup of bar orders on mill books. Bars right now are in tightest supply with customers banging at steel mill doors waiting to place fourth quarter tonnage. Consequently, any cancellations resulting from the killing off of the third quarter carryover after Oct. 7 will be quickly taken up by unplaced certified business.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 263

Boston — Buying of steel needed for construction is heaviest in reinforcing bars. Housing contracts for close to 5000 tons have been placed with several thousand additional tons to be awarded. Bulk of bridge requirements has been bought.

Structural Shapes . . .

Structural Shape Prices, Page 263

Chicago — Smaller structural fabricators are forced increasingly to rely on warehouses for shapes to complete orders under way. No improvement in structural supply is expected soon.

Boston — Fabricating shops are hard pressed to maintain schedules. Available supply of plain material is used to meet higher-rated projects, less important tonnages being extended.

New York — An increase in structural awards, involving principally bridges and industrial construction, is noted.

Pittsburgh — Restrictions on building are holding back considerable tonnage. There is little chance delayed projects will be able to proceed for months in view of the extremely tight supply position in structural.

Semifinished Steel . . .

Semifinished Prices, Page 263

Youngstown — Steel operations dropped to about 94 per cent of capacity last week from 106 the week preceding. The drop resulted from the shut-down by Youngstown Sheet & Tube Co. of its steel plant at the Brier Hill works as a result of a long-continued work slow-down. The plant tapped out 11 open hearths a week ago and suspended the blooming mill, where workers persistently had rolled 300 tons per eight-hour turn instead of the customary 1150 tons.

Chicago — Production of 6000 tons of steel ingots was lost at Gary steel-works of U. S. Steel Co. Sept. 28-30 when 47 workers in openhearth No. 3 staged a wildcat strike over a 1-day suspension of a union member for faulty work.

Detroit — Ford Motor Co.'s blooming mill broke down at its Rouge plant. Until it's repaired, billets are being shipped to two East Coast mills for rolling.

Pittsburgh — Whitney-Apollo Steel Co. resumed operations last Monday following a week's shutdown for lack

of sheet bars. No further shut-downs are expected though the usual difficulties of nonintegrated mills in obtaining prompt semifinished supplies are anticipated.

Warehouse . . .

Warehouse Prices, Page 269

Philadelphia — Warehouses are counting on an increase in their mill quotas from the present 85 per cent of base to 100 per cent, effective Jan. 1, but believe it will be considerable time before stocks will reach any semblance of normal balance.

Pittsburgh — Demand pressure on warehouses continues strong despite slackening in consumer durable goods lines. Distributors do not anticipate a balancing in stocks until well into next year at earliest.

Los Angeles — Warehouses are reducing bookings to strike a better balance between stocks, sales, and receipts.

Seattle — Warehouse executives are trying to obtain OPS approval of proposed price increases. Decreased turnover, rising overhead and higher freight rates have created a critical situation.

Pig Iron . . .

Pig Iron Prices, Page 262

Boston — Many consumers' inventories of foundry and malleable pig iron are at regulation limits, resulting in smaller shipments to these interests. This leaves more iron for less fortunate consumers and permits the district furnace to add some volume to its stockpile.

Mystic Iron Works advanced pig iron prices \$1.75 a ton for fourth quarter. New level is established under mutual agreement with shops by which furnace costs are reviewed for three months earlier production excluding the last month of the previous quarter, in this case September. Foundry iron is \$57, Everett, Mass.; malleable, \$57.50.

New York — Pressure for pig iron is increasing. Some foundries have a heavier volume of business and many are anxious to replenish inventories. Interest in imported iron lags because of the premiums asked.

Philadelphia — Pig iron supply falls short of demand and there is talk of need for additional capacity. Recent survey indicates need for additional merchant capacity. One interest surveying the possibilities of establishing a furnace and by-products unit in the district is said to be a Canadian chemical company. Colorado Fuel & Iron Corp. is understood to have made a study of prospects for establishment of blast furnace and oven coke capacity at Claymont, Del., in connection with the steel properties it acquired there some months ago. But there are no indications of early action.

Pittsburgh — Slower demand from consumer goods lines has not resulted in any particular easing in pressure on merchant iron sellers here as foundries attempt to accumulate inventories. Expanding defense requirements coupled with increasing inquiry from consumers outside the district take up the slack.

Cleveland — Tight supply conditions in merchant pig iron in this district is forcing consumers to go outside the

area for iron on an increasing scale. The merchant producer in the Pittsburgh district currently is in receipt of larger inquiry from Cleveland and vicinity, largely reflecting suspension of operations at the local merchant stack of the American Steel & Wire Co. This furnace, undergoing extensive repairs, is expected to come back into production in about a month.

Chicago — For first time since mid-May all of this district's 42 blast furnaces are in operation. Foundry iron demand is not quite as strong as recently and full pig iron output will help to keep pressure eased. Two or three stacks will go down for repairs before yearend, however.

Birmingham — Sustained foundry activity over the Southeast prolongs the acute shortage of pig iron.

Iron Ore . . .

Iron Ore Prices, Page 269

Cleveland — Lake Superior iron ore shipments totaled 12,671,805 tons in September, an increase of 481,225 tons over the movement a year ago. This brought the season's total to 71,516,546 tons, an increase of 12,557,096 tons, or 21.3 per cent, over the total for the like 1950 period. Shipments are holding up well, the movement for the week ended Oct. 1 having totaled 2,830,846 tons against 2,997,873 tons for the preceding week and 2,885,462 tons for the like week a year ago, reports the Lake Superior Iron Ore Association, this city.

Scrap . . .

Scrap Prices, Page 270

Philadelphia — Inventories of scrap continue to shrink. Operations at one mill were seriously threatened last week. Despite allocations a substantial portion of available tonnage continues to leave this district at upgraded levels.

Pittsburgh — The scrap collection drive isn't far enough along to permit of conclusions as to its effectiveness. Material is flowing in somewhat better volume but mill stocks are still shrinking. Hope continues high, however, that substantial additions to stockpiles will be generated before severe weather sets in. If this doesn't happen the steelmakers say there is bound to be serious contraction in openhearth operations this winter. Indicative of mill inventories currently, local district works of U.S. Steel have only about 5 days' stocks on hand and material is being brought in from all points of the compass. Two months ago stocks were sufficient to support 15 days' steelmaking.

Detroit — Cost of removing street car tracks is the overriding reason why more of this material has not been made available. Auto wreckers are seeking relaxation in smoke ordinances so nonmetallic parts can be burnt off. Demand from foundries is still suppressed. Mills are comfortable only on blast furnace grades.

Cincinnati — Scrap supply continues inadequate to meet mill needs fully. Campaigns to get out tonnages have not penetrated some sources, collectors complain. Supplies of most grades of cast are ample.

Chicago — Scrap receipts of steel mills continue nip and tuck with consumption. Moderate increase in vol-

ume is attributed more to good fall weather than results from the scrap drives. Milwaukee yards are now handling about 15 per cent more material than heretofore.

Birmingham — Scrap supplies continue exceedingly tight. The district's largest user is getting allocations, but only for current use.

Los Angeles — Buying of foundry grades of scrap is active as melters are more disposed to pay freight charges on remote material. Little scrap is being allocated here.

Seattle — Scrap consumers are on a day-to-day supply basis. Ceilings recently placed on material purchased in noncontiguous territory is restricting shipments from Hawaii and Alaska.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 267

Pittsburgh — Coke supplies are adequate to care for slower foundry operations. Demand pressure on merchant sellers continues light. Foundries are pacing their coke intake with receipts of pig iron.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 267

New York — Bolt and nut makers are running far behind schedules due to the shortage in bars. One leading maker is operating at 60 per cent of capacity, and has a seven months backlog; in the case of large nuts, more than 80 weeks at the present rate. Bolts are piling up at some plants.

Rails, Cars . . .

Track Material Prices, Page 265

Mt. Vernon, Ill. — Mt. Vernon Car Mfg. Division, Pressed Steel Car Co., has sufficient backlog of orders to keep the plant working at peak capacity through third quarter 1952.

Steel Imports Declining

New York — Steel imports are decreasing due to premiums, which are as much as \$40 a ton over domestic mill prices, and to heavy requirements abroad.

More than 2,330,000 net tons of steel were imported in the first six months, with the trend since then downward. Most of the tonnage has been imported from Belgium, France and Luxembourg. Holland has been contributing to the flow, especially in plates, while Turkey has been shipping cold-reduced sheets. Japan is actively soliciting business in a variety of steel products. Apart from high grade alloy steels, little has been coming in from England.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

9000 tons, Washington state plant for Aluminum Co. of America, to Bethlehem Pacific Coast Steel Corp., Seattle.

3600 tons, power plant, West Penn Power Co., Pittsburgh, to Fort Pitt Bridge Works, that city.

1100 tons, kraft plant, Weyerhaeuser Timber Co., Everett, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

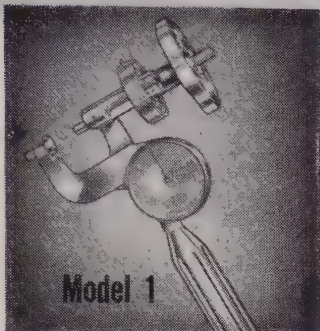
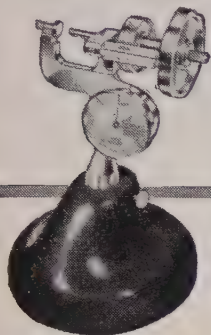
980 tons, plant addition, Union Carbide & Carbon Co., Portland, Oreg., to Bethlehem Steel Co.

890 tons, plant, American Can Co., Miami, Fla., to American Bridge Co., Pittsburgh.

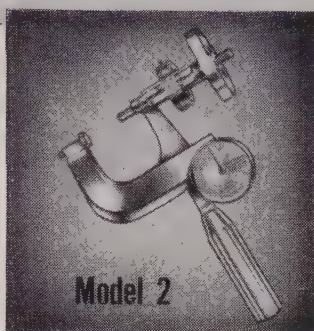
Ames Precision HARDNESS TESTERS

FOR ROCKWELL HARDNESS TESTING

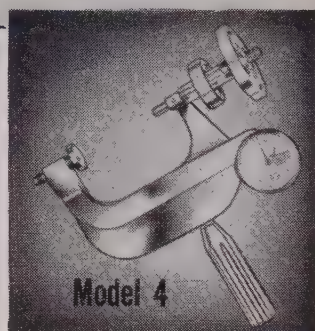
Today, hardness testing is coming into universal use as a necessity in the working and fabricating of metals. With Ames Testers, readings are made accurately, quickly, on-the-spot, directly in the Rockwell Hardness Scales.



Model 1
For testing round and flat stock, tubing, saws, knives, etc., up to one inch in Rockwell A, B and C Scales. Weighs only 1½ lbs.



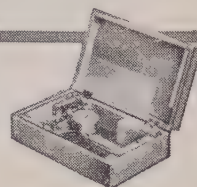
Model 2
For testing rounds and flats, dies, odd-shaped pieces, etc., up to two inches in Rockwell A, B and C Scales. Weighs 2½ lbs.



Model 4
For testing up to four inch capacity directly in Rockwell A, B and C Scales. Throat depth two inches. Weighs 3¼ lbs.

Cast Iron Bench Stand permits use of both hands when testing small parts. Tester is inclined at convenient angle and is firmly clamped in stand.

Box for Tester and Accessories Equipment includes diamond and 1/16" ball penetrators, two anvils, two steel test blocks, one brass test block and Rockwell Conversion Chart.



"See Ames Testers demonstrated at Metal Show"

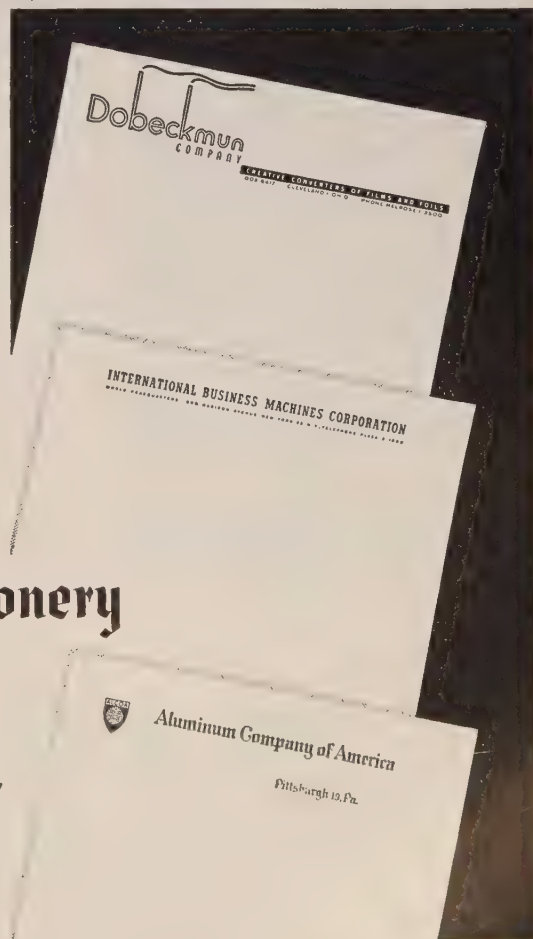
AMES PRECISION MACHINE WORKS
WALTHAM 54, MASS.

With a differential of
only a fraction of a cent per sheet
between the commonplace
and the commanding, a truly pres-
tige-building letterhead
is the biggest bargain on the market
for the average concern.

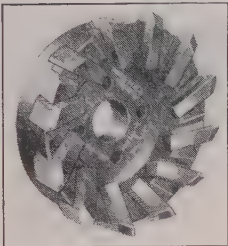
Distinctive Business Stationery

Peck Engraving Company

1066 HAMILTON AVENUE • CLEVELAND 14, OHIO



**INSERTED TOOTH
MILLING CUTTERS
WITH
DROP FORGED TAPERED
SERRATED
BLADES**



**BLADES ADJUSTABLE FOR SIZE
ALL TYPES AND SIZES
CATALOGUE ON REQUEST**

THE APEX TOOL & CUTTER CO., INC.
SHELTON, CONNECTICUT

**MATHEWS
CONVEYERS**

Since 1905. Engineers and manufacturers of Conveyers and Conveyor Systems for the Metal-working Industries.
Three modern plants. Engineering Offices in All Principal Cities. There's an Engineering Sales Office near you.



MATHEWS CONVEYER CO.
ELLWOOD CITY, PENNSYLVANIA
SAN CARLOS, CALIFORNIA
PORT HOPE, ONTARIO, CANADA

**CHEMSTEEL CONSTRUCTION
COMPANY, INC.**
208 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.

Send data on your Design, Engineering & Construction Facilities for erection of

**ACID-ALKALI-PROOF
TANKS & FLOORING**

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE..STATE....

875 tons, plant, American Can Co., Lemoyne, Pa., to American Bridge Co., Pittsburgh.
820 tons, two hospital buildings, Willard, N.Y., through P. J. Carlin, New York, to Bethlehem Steel Co.
585 tons, state bridge, Trenton, N. J., to American Bridge Co., Pittsburgh.
500 tons, jig erection plant, Boeing Airplane Co., Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.
470 tons, manufacturing building, Hayden Chemical Co., Mercer county, New Jersey, to Keystone Structural Steel Co., Trenton, N. J.
455 tons, plant addition, American Smelting & Refining Co., South Plainfield, N. J., to Bethlehem Contracting Co., Bethlehem, Pa.
350 tons, plant addition, International Silver Co., Wallingford, Conn., to Topper & Griggs, Hartford, Conn.
345 tons, Lincoln Tunnel approach, Port Authority of New York, to Harris Structural Steel Co., that city.
280 tons, factory building, Sylvania Electric Products Inc., Stoneham, Mass., to West End Iron Works, Cambridge, Mass., through Thomas Worcester Inc., Boston.
220 tons, plant addition, Pitney-Bowes Inc., Stamford, Conn., to Leake & Nelson, Bridgeport, Conn.
105 tons, reclamation, Cherry Lane bridge, Mineola, L. I., to Bethlehem Steel Co.
100 tons, housing project PHA 7-3, New Bedford, Mass., to Builders' Iron Works, Somerville, Mass.; Platt Construction Co., Cambridge, general contractor; 65 tons, reinforcing to Joseph T. Ryerson & Son Inc., Cambridge.
100 tons, bridge, New York, New Haven & Hartford Railroad, Mystic, Conn., to Bethlehem Steel Co.

STRUCTURAL STEEL PENDING

1700 tons, ordnance plant, Corps of Engineers, Army, Letterkenny, Pa.; bids Oct. 23.
500 tons, two technical buildings, Hanford, Wash., Works; bids Oct. 10.
161 tons, two schedules Babcock pump plant, Columbia Basin project; first bids rejected; new bids at Ephrata, Wash., Oct. 11.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2400 tons, Elmendorf air field, Alaska, outside facilities, to Bethlehem Pacific Coast Steel Corp., Seattle; Peter Kiewit Sons Co., Seattle, general contract.
1200 tons, Alcoa's aluminum plant, Wenatchee, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.
300 tons, reinforcing and structurals, housing project PHA 5-2, New Britain, Conn., to Scherer Steel Co. and City Iron Works, Hartford, Conn.; Anderson Fair Oaks Construction Co., Hartford, general contractor.
200 tons, factory building, Sylvania Electric Products Inc., Stoneham, Mass., to Concrete Steel Co., Boston; Thomas Worcester Inc., Boston, engineer-contractor.
150 tons, south end junior high school, Stratford, Conn., to Fox Steel Co., New Haven, Conn.; Harry Maring Jr. Inc., Bridgeport, Conn., general contractor; 75 tons structural steel to New England Iron Works, New Haven.

REINFORCING BARS PENDING

5000 tons, also 1400 tons shapes and 1400 tons plates, Eklutna tunnel and power plant, Palmer, Alaska; general contract to Palmer Constructors, Omaha, Neb., on rebid \$17,348,865 by Bureau of Reclamation, Denver.
140 tons, laterals and other work, Columbia Basin project; first bids rejected; new call Oct. 11 to Bureau of Reclamation, Ephrata, Wash.

PLATES . . .

PLATES PENDING

3000 tons (estimated) storage tanks and fueling systems, Fairchild air field, Spokane, Wash., McChord air field, Tacoma, Wash. and Great Falls, Mont.; general bids in to U. S. Engineer.

PIPE . . .

CAST IRON PIPE PENDING

1000 tons, 42 to 30 inch, sewage disposal system; bids in to Portland, Ore.

600 tons, 24 inch, system expansion, Portland, Ore.; bids in Sept. 28.

RAILS, CARS . . .

RAILROAD CARS PLACED

Bessemer & Lake Erie, 500 seventy-ton hoppers, to Greenville Steel Car Co., Greenville, Pa.
Duluth, Mesabi & Iron Range, 250 seventy-ton hopper cars, to Mt. Vernon Car Mfg. Division, Pressed Steel Car Co., Mt. Vernon, Ill.
Norfolk & Western, 1000 seventy-ton hoppers, to Virginia Bridge & Iron Co., Roanoke, Va.

RAILS PENDING

Unstated tonnage, 1952 rail requirements, plus accessories, New York Central, bids closed Oct. 5.



**STEEL
Tubing**

**PROMPT
DELIVERY
FROM STOCK**

Mechanical Tubing 1/4" to 14" O.D. •
Seamless Pipe to 24" O.D. • Boiler &
Pressure Tubes — Seamless or Welded from
3/4" • Stainless Steel Pipe, Tubing & Fittings •
Tube Fabrication, Bending, Swaging, Upsetting,
etc.

A B MURRAY CO. INC.

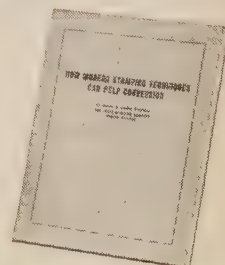
606 Green La.
Elizabeth, N. J.
EL 2-8182

Box 405-H
McKeesport, Pa.
McKPT 4-9107

**LEAKE
Creative
METAL
STAMPINGS**

The LEAKE Organization offers designing and engineering service with complete production facilities for stampings of any size or shape from carbon or alloy steels, magnesium or aluminum alloys, copper or brass alloys, and stainless or monel metals.
Press capacities up to 2500 tons... mechanical or hydraulic.

**Literature
available
...WRITE!**



THE LEAKE STAMPING CO.
MONROE, MICHIGAN

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Soveda Offers French Steel

Union Sidérurgique du Nord de la France (USINOR), largest steel enterprise on the European continent, organized a sales subsidiary, Soveda Inc. with headquarters at 20 Pine St., New York. René R. Thieren is president of the new company. Production of steel by USINOR is about 1,250,000 metric tons a year and will be increased to 1.5 million tons in 1952.

Celebrates 75th Anniversary

Hendrick Mfg. Co., Carbondale, Pa., is celebrating its 75th anniversary. The company produces thousands of sizes of perforated metal in hundreds of shapes and designs, besides manufacturing many other products, including ornamental metal grilles, open steel flooring, treads and armor-grids, and screens.

Equips Screw Machine Plant

Automatic-Screw Products Co. equipped 3500 square feet at 882 Homewood Ave., Baltimore, for production of small screw machine items. This company recently moved to Baltimore from New York. Leroy Dixon is owner.

Chevrolet Enlarging Plant

Construction has begun on the \$20.8 million defense expansion at the Chevrolet plant in Tonawanda, N. Y. The plant will employ up to 3500 workers, giving Chevrolet a total employment in the Buffalo district of about 12,000.

National Broach Moves

National Broach & Machine Co., manufacturer of gear finishing and inspection machines, broaches, broaching fixtures and special production machines, moved into its new administration building at Shoemaker and St. Jean avenues, Detroit. Space formerly used for offices and engineering is being used for manufacturing.

Machinery Fair Scheduled

Interstate Machinery Co. Inc., Chicago, will hold its second annual machinery fair and open house from Nov. 14 through Nov. 17. Over 2000 new, used and rebuilt metalworking machines will be exhibited in the Interstate warehouse at 1431 W. Pershing Rd., that city. The firm's own machinery rebuilding plant will be in operation. Experienced

machinery men will answer questions and give advice on various production methods and problems.

Monarch Machine Expands

Monarch Machine Tool Co., Salem, O., will make a large addition to its facilities for producing tracer-controlled automatic lathes and engine and toolmakers lathes. The new construction will expand Monarch's present plant 200 feet in length and involves the building of three additional bays, two of which will be 300 feet long.

Harig Mfg. Building Plant

Harig Mfg. Corp.—dies, jigs, fixtures, tools and special machines—Chicago, is building a new plant at 5757 Howard St., Niles, Ill.

Morrison Steel To Expand

Morrison Steel Products Inc., Buffalo, launched a record \$1,720,000 expansion program. The firm reported a \$2.5 million backlog of defense orders covering ordnance and aircraft items.

Riverside Making Fuzes

Production is under way on the Army Ordnance Department \$2 million contract for "workhorse" artillery fuses, awarded to Keystone Watch Case Division, Riverside Metal Co., Riverside, N. J.

Builds Iron Works Plant

A plant is being erected at 6300 Holabird Ave., Baltimore, to engage in ornamental iron works. While no name has yet been chosen to identify the project, Benni Zelubowski and Otto Schnider are partners in the enterprise.

Fire Damages Ontario Plants

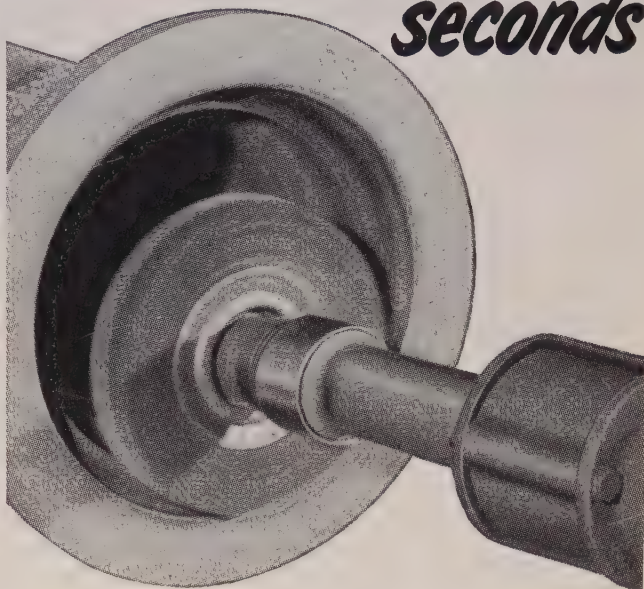
A \$250,000 fire damaged the Hall Foundry Co. Ltd. and the Standard Casting Mfg. Co. in Hespeler, Ont. The fire reportedly started when a spark from an acetylene torch ignited oil.

Convair Plans Design Center

Consolidated Vultee Aircraft Corp., San Diego, Calif., will construct a \$3 million engineering development center at San Diego's Lindbergh Field. Facilities for design engineering in aerodynamics, hydrodynamics, hydraulics, electronics guidance research, and research and instrumentation will be provided. The new center will emphasize research and design of atomic projects, supersonic aircraft,

This Special Pittsburgh Brush*

CLEANS RED-HOT CASTINGS in 30 seconds



** An actual case history from the U. S. Pipe and Foundry Company, Birmingham, Alabama*

A PITTSBURGH brush provides the answer for U. S. Pipe and Foundry's problem of cleaning red-hot castings. This rugged brush works 40 hours a week, turning out thoroughly cleaned castings at the rate of one every 30 seconds . . . a speed record for any brush cleaning operation of this type.

LET PITTSBURGH ENGINEERS SOLVE YOUR BRUSH PROBLEMS

Pittsburgh's complete line of brushes of every type, for every purpose, will provide a practical, economical solution of any brush problem you might have. Drop us a line on your company letterhead for a copy of our new booklet that shows, through actual case histories, how Pittsburgh can help cut your brushing operation costs. Address: PITTSBURGH PLATE GLASS COMPANY, Brush Div., Dept. W14, 3221 Frederick Ave., Baltimore 29, Md.



PITTSBURGH



Power Driven BRUSHES

BRUSHES • PAINT • GLASS • PLASTICS

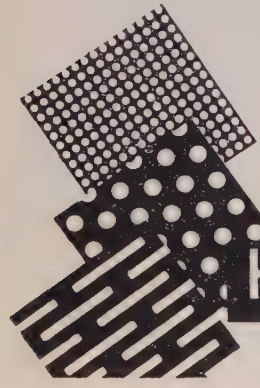
PITTSBURGH PLATE GLASS COMPANY

Perforated SHEET MATERIALS

Metals—Plastics
Fabrikoids
and Others
at
H & K



- Unlimited Choice of Patterns
- Accurate Holes
- Smooth Surfaces
- Design Facilities for New Applications



HERE AT H & K, you'll find an intelligent consideration of your industrial problems. Maximum cooperation is afforded designers and product engineers in the creation of Perforated Metals and other materials . . . providing the desired end results at lowest possible cost.

H & K Perforated assures you an extremely wide selection of both industrial and ornamental patterns. Our recommendations will suggest the most suitable materials available, with special consideration for features of corrosion resistance, strength and dependably accurate patterns.

Also Remember—H & K Grilles . . . Ultimate in Beauty . . . Utility . . . LONG LIFE!

The Harrington & King PERFORATING CO.

5634 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, N. Y.

PRODUCTION MARKING

ROUND AND TAPERED PARTS



Mark part numbers, trademarks, stock numbers, special lettering or designs on couplings, fuses, bushings, bearings, tubular sections, lamp bulb bases, etc., with the Matthews "201" Marking Machine . . . at production rates up to 3600 per hour. Produce more for less with a "201".

Write for complete literature and information.

JAS. H. MATTHEWS & CO.

3978 FORBES ST. • PITTSBURGH 13, PA.
NEW YORK • BOSTON • PHILADELPHIA
CHICAGO • CLIFTON, N. J.

MASTER MAKERS OF FINE BEARING METALS SINCE 1860

A. W. Cadman Mfg. Co.

28th and SMALLMAN STS., PITTSBURGH 22, PA.

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By *Albert Portevin*

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages
69 illustrations

4 tables
Price \$5.00 Postpaid

THE PENTON PUBLISHING CO.

Book Department, 1213 W. 3rd St., Cleveland 13, O.

Lewis TRAVEL-CUT

AUTOMATIC ... HIGH SPEED ... HEAVY DUTY

Machines for 1/16" to 3/4" Rod. Rounds and Shapes.
THE LEWIS MACHINE CO., 3450 E. 76th St., Cleveland, Ohio

Wire STRAIGHTENING and CUTTING MACHINES



NO, THEY'RE NOT: Bound for U. S. Steel Corp.'s new Fairless Works, Morrisville, Pa., this 42,600-pound cast steel cinder pot has a capacity of 600 cubic feet. The diameter at the top is almost 12 feet, and at the bottom six and one-half feet. This is the first of 27 cinder pots which soon will be carrying molten slag at the Fairless Works.

No, the young ladies are not being shipped to Morrisville

jet bombers, flying boats, guided missiles and electronic apparatus.

Metal Products Firm Expands

Precision Metal Products Co., Plastics Division, whose plant is at the rear of 939 York Rd., Towson, Md., installed a sheet metal department, in addition to adding equipment to its plastic division.

Gorham Appoints Distributor

Gorham Tool Co., Detroit, appointed Sonnet Supply Co., Hawthorne, Calif., as its West Coast distributor. Jobbers will be appointed by Sonnet to carry the Gorham line of standard cutting tools and allied products.

District Sales Office Moved

Babcock & Wilcox Tube Co. moved its Beaver Falls, Pa., district sales headquarters to 712 Eleventh St., that city.

Laurens Enlarges Plant

Laurens Bros. Inc., dealers and rebuilders of machine tools, completed an addition to its plant at 2780 Highland Ave., Cincinnati.

Raymond Boosts Output

Production of materials handling equipment by Raymond Corp., Greene, N. Y., will be increased about 70 per cent. The company acquired a plant at Morris, N. Y., from Linn Mfg. Corp. and has begun manufacturing operations there. The company also has expanded operations at its main Greene plant.

Metal Sign Maker Expands

National Safety Engineers, Birmingham, will enlarge its plant and will install new machinery and equipment at a cost of \$100,000. The company is marketing metal highway and industrial signs in each of the 48 states.

Foundry Firm Incorporated

Depew Foundry Corp. was incorporated in Buffalo. Principals are Mildred Ruth, Arlene G. Missener and Celia Tully.

Lockheed To Expand Further

Lockheed Aircraft Corp., Burbank, Calif., will construct a \$12,615,000 aircraft assembly plant for the Air Force at Palmdale airport, Calif. The new facility is for final assembly and test flying of jet trainers and fighters.

Bliss Moves Chicago Office

E. W. Bliss Co., Toledo, transferred its Chicago office to 2135 S. Austin Blvd. B. E. Meyer is district manager.

Almco Establishes Branch

Almco, Albert Lea, Minn., purchased the R. F. Wuerfel Co., Detroit, former distributor for its products in Ohio, Michigan and Indiana. Mr. Wuerfel will continue in the capacity of branch manager. Research and sample processing facilities are being expanded at the Detroit branch. The company produces barrel finishing equipment, handling and separating equipment, abrasive me-

WHEELING STEEL CORPORATION

WHEELING, WEST VIRGINIA

COP-R-LOY PIPE-SHEETS

Ductillite

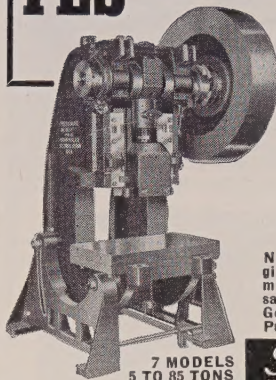
THE MODERN TIN PLATE

LA BELLE CUT NAILS



YES . . . WE CAN FURNISH AN AIR FRICTION CLUTCH

with our



7 MODELS
5 TO 85 TONS

PRESS-RITE

**85 TON
POWER PRESS**

Now . . . for the first time . . . this Press-Rite giant is available with the smooth power transmission of an air friction clutch—plus the added safeguard of a spring-applied brake! Get full details on all the features of the Press-Rite line. Write for Bulletin P-650, TODAY!

Sales Service Machine Tool Co.
Press-Rite Presses • Shape-Rite Shapers • Keller Power Hack Saws
2361 UNIVERSITY AVENUE • ST. PAUL 4, MINNESOTA

**Control Temperatures More Closely
REDUCE COST • SAVE TIME**

This CATALOG
of
IMPROVED
PYROMETER
SUPPLIES
shows you how!

Get your **FREE COPY**
TODAY!



★ **THERMOCOUPLES** ★ **PROTECTION TUBES**
★ **THERMOCOUPLE WIRE** ★ **LEAD WIRE**
★ **INSULATORS** ★ **TERMINAL HEADS**

Please send free copy of Catalog No. 5.

Name Title
Company
Street
City State

ARKLAY S. RICHARDS CO., Inc.
NEWTON HIGHLANDS 61, MASS.

REED ENGINEERING COMPANY

MODERN METALWORKING MACHINES

1005 W. FAIRVIEW
CARTHAGE, MO.

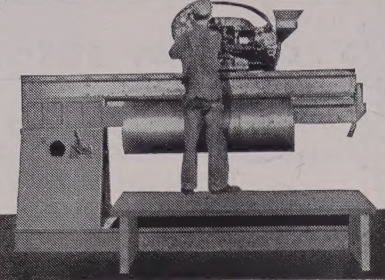
HORN TYPE WELDING JIGS

Write for Bulletin 66

- IN 6 MODELS
- CAPACITIES UP TO 9 FT. X 3/4 IN.
- IN TWO STYLES FOR LIGHT OR HEAVY CYLINDERS
- WATER-COOLED COPPER WELD BACKING BARS
- POSITIVE, RIGID, TOGGLE-ACTION CLAMPING

WELDING FIXTURES • OFFSET & CONTOUR FORMERS

SPECIAL MACHINES & FIXTURES



Versatility counts in

HOT DIP GALVANIZING

any size or shape product, any size order from the smallest to the largest

Excellent facilities for pickling and oiling

ENTERPRISE

GALVANIZING COMPANY

2325 E. Cumberland Street Philadelphia 25, Pa.

Famous

FOR ACCURACY OF THREADS
LOW COST OF CHASERS
LESS DOWNTIME. 100% DEPENDABILITY

Free Bulletins

THE EASTERN MACHINE SCREW CORPORATION
22-42 BARCLAY ST., NEW HAVEN, CONN.
Pacific Coast: A. C. Behringer, 334 N. San Pedro St., Los Angeles. Canada: F. F. Barber Machinery Co., Toronto.



HIGH SILICON IRON.

JISCO

SILVERY PIG IRON

A Blast Furnace Product made from only Virgin Ores

THE JACKSON IRON & STEEL CO. • JACKSON, OHIO

For 50 Years

MOLINE "HOLE-HOG" MACHINE TOOLS

HAVE SERVED AMERICAN INDUSTRY 1901 - 1951

DRILLING - BORING - HONING - TAPPING and SPECIAL MACHINES

MOLINE TOOL COMPANY

102 20th St. MOLINE, ILLINOIS

COPPER—BRASS—BRONZE PERFORATED TO YOUR REQUIREMENTS

PERFORATED METALS

FOR ALL INDUSTRIAL USES
SEND FOR CATALOG No. 35
ARCHITECTURAL GRILLES

DIAMOND MFG. CO.

BOX 32 WYOMING, PA.

THE BELMONT IRON WORKS

STRUCTURAL STEEL—BUILDINGS & BRIDGES

RIVETED—ARC WELDED Cable Address—Beliron

Engineers—Fabricators—Erectors—Contractors—Exporters

Shops—Philadelphia—Eddystone—Ryersford

Main Office: Phila. 46, Pa.

New York Office—44 Whitehall St., N. Y. 4, N. Y.



The **Cleveland Steel Tool Co.**

• PUNCHES • DIES • CHISELS • RIVET SETS •

IF IT'S RIVETED YOU KNOW IT'S SAFE

WE FEATURE SPECIAL PUNCHES & DIES

660 E. 82nd ST., CLEVELAND, O.

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

dia and barrel finishing compound.

Canadian Can Plant Opened

American Can Co., New York, opened a new can producing plant at Chatham, Ont., its sixth in Canada. The plant covers 185,000 square feet of floor space. Initial capacity is 300,000,000 cans a year.

Machine Firm Will Move

Valley Automatic Machine Co., Endicott, N. Y., will move its facilities into a new plant to be constructed in Vestal, N. Y. The firm, owned by George Bisgrove and Robert Burtless, produces screw machine parts.

Super Tool Lists Net Prices

Super Tool Co., Detroit, issued a net price schedule, effective as of Sept. 1. This schedule lists prices of 25 types of standard solid carbide and carbide-tipped tools manufactured by the company.

MacGlashan Opens Factory

MacGlashan Air Machine Gun Co., Stanton, Calif., moved into a new factory on Chestnut St., that city.

Rheem Builds Plant in West

Rheem Mfg. Co., South Gate, Calif., is constructing an office and other buildings for manufacture of jet aircraft parts.

Thor-Canadian Plans Opening

Thor-Canadian Co. Ltd., Toronto, Ont., plans to open a new \$750,000 plant in Etobicoke, Ont., in December. It will add 50,000 square feet of manufacturing space and is the first of two large buildings in a current expansion program.

Bronze Fittings Firm Moves

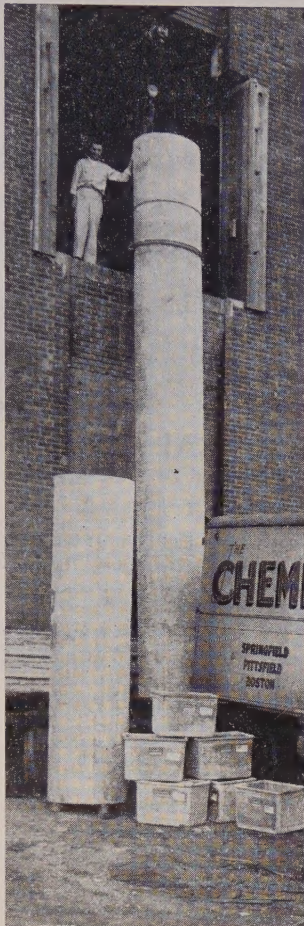
James Jones Co., Los Angeles, will move to 321 N. Temple City Blvd., El Monte, Calif., upon completion of a \$350,000 building for manufacture of bronze valves and fittings for underground water service connections, fire protection fittings, items for gas utilities and oil lines.

Swiss Firm Appoints Agent

Lienhard & Co., La-Chaux-de-Fonds, Switzerland, manufacturer of high precision engraving machines, pantographs and similar equipment, appointed Carl Hirschmann Co., Manhasset, N. Y., their exclusive representative in the United States.

Los Angeles Offices United

American Cyanamid Co., New York, consolidated its several offices and warehouses in Los Angeles into one newly-constructed building at 2300 S. Eastern Ave. Sheldon Dahl is West Coast manager in charge of sales and manufacturing of the industrial chemicals and



RESIN-BONDED: Pla-Tank, product of Chemical Corp., Springfield, Mass., is a resin-bonded plating tank. Here's the largest one it has ever molded, 24 feet deep by 3 feet in diameter. It will go to Lane Plating Works, Dallas, where it will be used for hard chrome plating the inside of working barrels for oil wells. Chemically resistant to common acids, solvents and bleaches, the light, strong material is being offered in the form of drain pipe, ventilating hoods, fabricated parts and containers

plastics and resins divisions, while Edward Larson is regional manager of Lederle Laboratories Division.

Simonski Opens New Plant

Gilbert S. Simonski Co., maker of electric furnaces, moved to its new building on Easton pike, Neshaminy, Bucks county, Pennsylvania. Anthony Lipsi is general manager.

Swartout Establishes Branch

Swartout Co., Cleveland, established a sales and service office in Houston. William A. Sharp is in charge of ventilator sales engineering and service while J. B. Downey is in charge of steam specialties sales and service. Howard T. Rieley will continue to represent the company in Texas, operating from the company's office at M & M building, Houston.



"SEE WHAT WHITEHEAD CAN DO ON THESE STAMPINGS"

All types and sizes. Assembling, finishing, diemaking. Detroit plant with operations developed over half-a-century. Nationally known for accuracy, value, dependability. Send your blueprints for an estimate.



WHITEHEAD STAMPING CO.

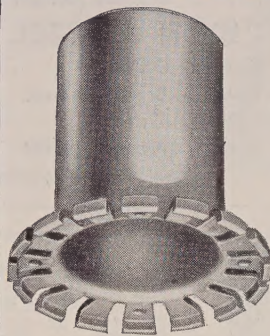
1667 W. Lafayette

Detroit 16, Mich.

ELIMINATE COSTLY SHUT-DOWNS WITH HEIL ACID-PROOF EQUIPMENT

- PICKLING TANKS
- LINED PIPE
- ACID-PROOF HEATING UNITS

HEIL PROCESS EQUIPMENT CORPORATION
12901 Elmwood Ave. • Cleveland 11, Ohio



UNIFORM METAL PARTS

Our experienced craftsmen take pride in producing uniform stampings of the highest quality material. Your specifications carefully followed. Send blueprints or samples for quotation.

WORCESTER STAMPED METAL CO.

Established 1883

10 HUNT STREET • WORCESTER, MASS.

OHIO LOCOMOTIVE CRANES

GASOLINE • DIESEL
ELECTRIC • STEAM

25 TO 40 TON
CAPACITY



THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO



**ARTUS
PLASTIC
SLITTING
MACHINE
SHIMS**

COST JUST A FRACTION
OF METAL SPACERS

THE COLOR TELLS
THE THICKNESS

ALWAYS RETAINS
UNIFORMITY AND
EVENNESS UNDER ALL
NORMAL CONDITIONS

Save Time! Save Money!

INDUSTRIAL PRODUCTS SUPPLIERS

201 South Dean Street
Englewood, N. J.

MATERIALS -- USED EQUIPMENT

RAILROAD EQUIPMENT--FOR SALE STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 50-Ton
Cabooses, Eight Wheel, Cupola Type
Flats, 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite or All Steel, 50-Ton and 70-Ton

Hoppers, Covered, All-Steel, 50-Ton & 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 8,000-Gallon, Class II

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

STANDARD GAUGE DUMP CARS

Side Dump, 16-Yd., 30-Ton, Lift Door
Side Dump, 20-Yd., 40-Ton, Lift Door

End Dump, 20-Yd., 50-Ton, Drop Door
End Dump, 10-Yd., 30-Ton, Lift Door

STANDARD GAUGE LOCOMOTIVES

Two Plymouth Diesel-Electric, 45-Ton, Standard Gauge, Type 0-4-0, Built 1942

Gasoline—10-Ton to 25-Ton

Diesel-Mechanical—8-Ton to 30-Ton

Gasoline-Electric—35-Ton

One Plymouth Model KC Flexomotive, 65-Ton, Standard Gauge, Type 0-6-0, Built 1940

Send us your inquiries

We Buy Freight Cars for Dismantling

Send us your offerings

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS
For
All Types of
Freight Cars

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D. Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING" containing IRON or STEEL"

RAILS NEW and RELAYING

Your exact trackage needs filled "Faster From Foster" Track Tools & Accessories are properly matched and fabricated to meet all requirements and shipped from a reliable source.

"FASTER from FOSTER"

RENT STEEL SHEET PILING

All Lengths, Sections, all standard makes your job requires. Also Rent Pile Hammers, Pile Extractors.

TRACK ACCESSORIES • PIPE • WIRE ROPE

LB FOSTER co.

Pittsburgh 30, Pa. New York 7, N.Y.
Chicago 4, Ill. Houston 2, Tex.

For Sale

COLD FINISHED BARS

21/32"	Rd. 10/12'	51100	14250 #
1-13/16"	Rd. 10/12'	52100	6500
2-1/16"	Rd. 10/12'	B1112	2650
27/32"	Rd. 10/12'	52100	700

HOT ROLLED BARS

1-3/16"	Rd. 10/12'	52100	7000 #
3 1/2"	Rd. 10/12'	52100	3400
3 3/4"	Rd. 10/12'	4320	1500
5"	Rd. 10/12'	4320	1100

CORE RODS

5/16" Rd.	H.R.	14' Len.	25000 #
7/16" Rd.	H.R.	14' Len.	8000

SEABOARD STEEL CO., INC. New Haven, Conn.



RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-
FERROUS SCRAP

**BOUGHT-SOLD
LIQUIDATED**

DULIEN STEEL PRODUCTS, Inc.
of Washington

9265 E. Marginal Way • Seattle 8, Wash. • Lander 6000

BRIDGE CRANES

ARNOLD HUGHES COMPANY

765 Penobscot Bldg. Detroit, Mich.
Woodward 1-1894

BORING MILLS, 24"-36"-42"-52"-66"-72".
HAMMER, NAZEL, 5-N, 6" x 6", M.D.
KEYSEATERS, Nos. 1, 2 and 5, BAKER.
LATHE, 42" x 30' PUTNAM, M.D.
SHAPER, 36" MORTON Draw Cut, M.D.
SHEAR, 156" x 1/4" HYDE PARK, 18" Gap.
STRAIGHTENER, 1-A SUTTON, 2" tube 1 1/2" solid.

WEST PENN MACHINERY COMPANY
1210 House Bldg. Pittsburgh 22, Pa.

**WANTED
BRIDGE CRANES**
ARNOLD HUGHES COMPANY
765 Penobscot Bldg. Detroit, Mich.
Woodward 7-1894

**FOR SALE
NEW CAST IRON PIPE**
25,000 feet 6" Bell & Spigot, Class 150
and 10,000 feet 4", Class 150.
Jafra, Incorporated
Drawer E, Little River Station, Miami 38, Fla.
Phone 7-4571

**FOR SALE
100 KW TOCCO INDUCTION HEATING UNIT
THREE STATION
EXCELLENT CONDITION**
WINSTON MACHINERY CO., INC.
526 SOUTH ALABAMA STREET
INDIANAPOLIS 25, INDIANA

**IT
WILL
PAY
YOU**

to read and use the "Equipment—Materials" pages of STEEL. Follow this section every week for unusual buys and use it to tell other readers of the equipment or materials you have for sale. Rates are moderate. For information write STEEL, Penton Bldg., Cleveland 13, O.